

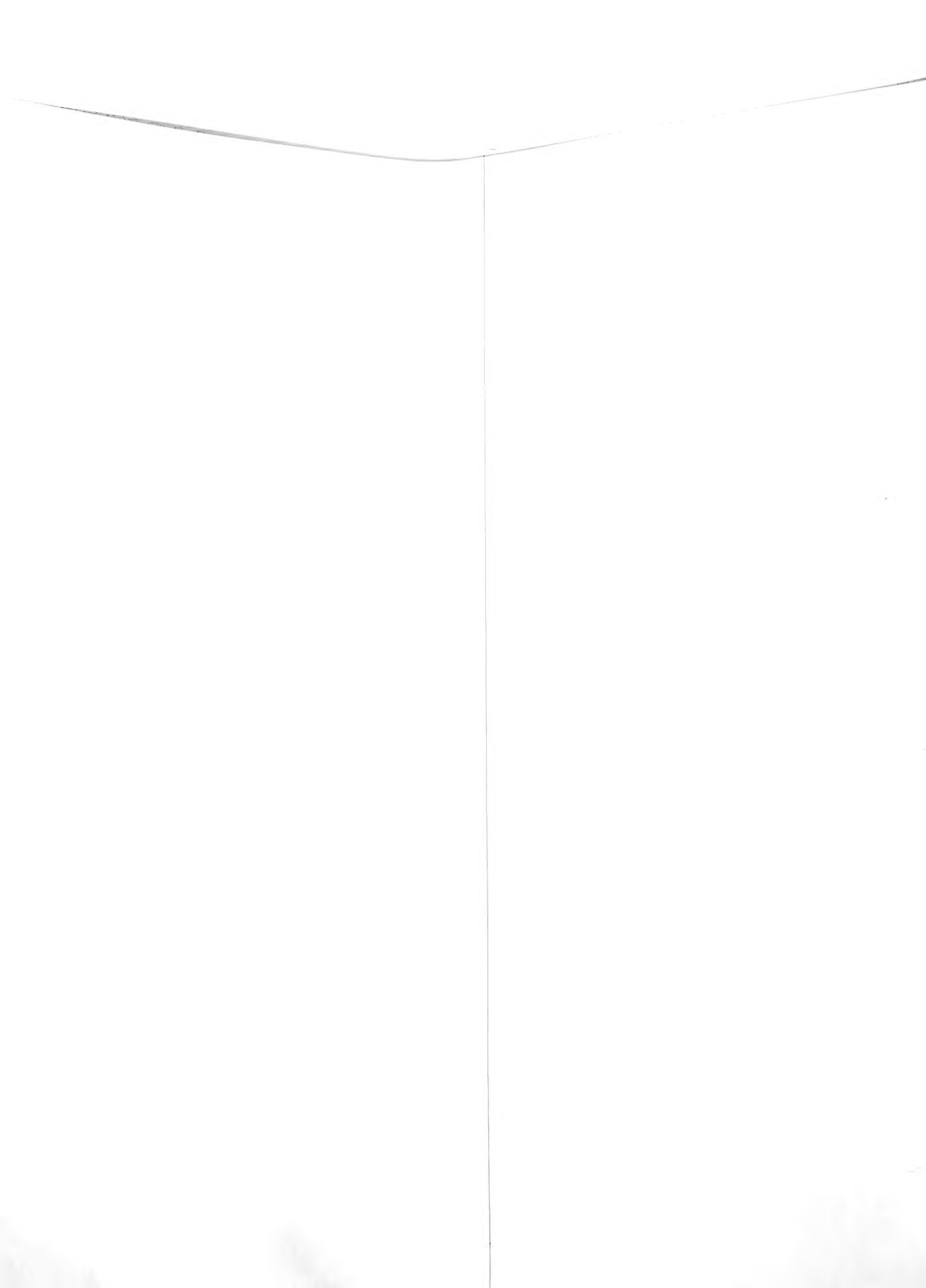


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(1908-1909)

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ZOOLOGICAL SOCIETY BULLETIN

No. 30

Published by the New York Zoological Society.

July, 1908

THE MOUNTAIN GOAT BREEDING IN CAPTIVITY.

ON May 20, 1908, the first Rocky Mountain Goat ever bred in captivity, was born in the New York Zoological Park. Its parents were brought from British Columbia by Director Hornaday in November, 1905, with three other specimens. All five were born in May, 1905, and were captured in the mountains north of Fort Steele.

Since the arrival of the little herd in New York, all of its members have been maintained in excellent health. They are fed upon very clean crushed oats (in the hull), sliced carrots and potatoes, an occasional apple and all the clover hay they can eat. There are three adult males and two females, and they have been

given three large corrals and a rustic barn in the southwestern corner of the Park. For amusement and exercise they climb all over the roof of the barn, and spend much time aloft.

Although very level-headed and calm in times of real danger, the Mountain Goat is shy of being handled and petted, and with nervous impatience flings itself away from an outstretched hand. But one member of the herd will permit its keeper to touch it. Although they are not quarrelsome toward each other, they were so free in prodding each other with their skewer-like horns it was necessary to saw an inch from each horn-tip.

Quite a number of goats have come into cap-



ROCKY MOUNTAIN GOAT AND KID BORN IN THE ZOOLOGICAL PARK.



ROCKY MOUNTAIN GOAT KID.
Three days after birth.

tivity, but very few have survived longer than a few months. The climatic conditions of the Atlantic coast region have carried off eight other goats of our acquaintance in two years or less, and until now it has been doubted whether it were possible to acclimatize the species on the Atlantic coast, and maintain it in health and vigor up to the breeding point. For this reason, the news of the birth in the New York herd will be hailed with delight by all sportsmen and nature-lovers.

The period of gestation was from November 25, 1907, to May 20, 1908, or four days less than six months. The kid now in the public eye was born at 3 A. M. At 3.10 it arose to its feet; by 3.30 it was *jumping* about the stall, and climbing upon its mother's back, as she lay upon the straw. It nursed for the first time at 3.20. Two days after birth it was thirteen and a half inches high at the shoulders, and weighed seven and a quarter pounds. Of course its pelage is pure white, and, like nearly all young hoofed animals, its eyes now are practically black. It is very strong and capable, and seems to take a very hopeful view of life. It is a male, and has been christened "Philip," for reasons that every goat-hunter will understand.

While nursing, it stands directly under its mother's body, and makes a continuous whining noise, like a young puppy. Frequently it butts the udder, and then the mother patiently raises

a hind leg, to give her offspring the best possible opportunity. The mother is a model of what wild-animal mothers should be, a good milker, affectionate, solicitous for her offspring, and quiet and sensible toward her keeper.

The Zoological Park goat herd is in charge of Keeper Bernard McEnroe, who has managed it with great skill and success. He never permits any of the goats to get thoroughly rain-soaked, but shuts up the herd whenever it begins to rain. In New York it was quickly learned that *Oreamnos* can not endure rain. The pelage absorbs water like a sponge, holds it for hours, and the animals have not sufficient vitality to endure it.

THE NEW YORK ZOOLOGICAL PARK.

ITS PRESENT STATUS, AND HOW IT APPEARS TO FOREIGN CRITICS.

AT this date the New York Zoological Park may be regarded as seven-eighths complete. But for the unfortunate financial conditions which have prevailed during the past six months, and which seem destined to influence both the public mind and the public purse during the next half year, the end of 1909 would have witnessed the rounding-up of the Zoological Society's work in the Bronx.

On August 11, 1908, ten years will have elapsed since the beginning of work in the improvement of the Park. It will be remembered that the Park was formally opened to the public on November 8, 1899. But for the temporary halt in the erection of the final buildings, the Park would have been rendered practically complete in eleven years from the beginning of active work. At present there remain to be erected the Elephant House yards and the Administration Building—funds for which have already been formally appropriated, and at last are expendable, and also the Zebra House, and the Eagle and Vulture Aviary—as yet unprovided for. The end of all this is so near, that it seems reasonable to hope the very small amount of additional funds required to secure



BOSTON ROAD ENTRANCE TO THE ZOOLOGICAL PARK.
Recently completed at West Farms.

the completion of the Park can be made available within a short time.

In the total number of mammals, birds, reptiles and amphibians on exhibition, the Zoological Park stands to-day at the head of all the zoological parks and gardens of the world. The Twelfth Annual Report of the Zoological Park contains the following table showing our rank according to the total number of living specimens on exhibition.

All are as of January 1, 1907, except New York and London, which are for 1908.

| Institution. | Mammals. | Birds. | Reptiles and Amphibians. | Total. |
|--------------------------|----------|--------|--------------------------|--------|
| New York Zoological Park | 607 | 2530 | 897 | 4034 |
| Berlin | 946 | 2176 | 27 | 3149 |
| London | 873 | 1621 | 478 | 2972 |
| Philadelphia | 487 | 952 | 1087 | 2526 |
| Hamburg | 473 | 1665 | 251 | 2389 |
| Schoenbrunn | 593 | 1351 | 171 | 2085 |
| Cologne | 424 | 1479 | 98 | 2001 |
| Breslau | 592 | 1067 | 184 | 1843 |
| Frankfort | 644 | 1002 | 158 | 1804 |

The character of the New York Zoological Park as a whole, its grounds, its buildings and its collections, are in the main quite well known to the people of New York City and vicinity. To-day the buildings of the first class that are complete, occupied by animal collections and open to the public, are ten in number, not count-

ing the magnificent new Elephant House, which will be completed in the autumn or early winter. Of second class animal buildings there are ten more, and of *large groups* of outdoor dens, aviaries and corrals, there are twelve. There are also eight entrances, six public comfort buildings, two restaurants and three animal storehouses for winter use. The area of the Park in land and water embraces 264 acres. Of walks and roads there are about eight miles, and of fences ten and one-half miles. The maintenance force of the Park, constantly on duty, embraces 141 persons. The number of visitors in 1907 was 1,273,046,—nearly one-third of the entire population of the metropolis of the American continent. Of this number it is estimated that a quarter of a million visitors were from outside of New York City.

To all members of the New York Zoological Society, and to all residents of New York, the opinions of foreign critics on the Zoological Park are of much interest. Entirely aside from the value of local opinion, it is worth while to see ourselves as others see us. On this point we may quote the opinion of three German professors who came to America last August as delegates to the Seventh International Zoological Congress. At the close of their visit in New York, they addressed to one of the leading newspapers of this city the following letter:



GROUP OF YOUNG GIRLS FROM A LOWER EAST-SIDE SCHOOL.

Thousands of school pupils, conducted by their teachers, annually visit the Zoological Park.

NEW YORK, Sept. 1st., 1907.

To the Editor of the

New York Staats-Zeitung:

"As a supplement to your article headed 'In the Lion House,' which appeared in No. 208 of the *New York Staats-Zeitung*, we take the liberty to send you, in a few words, the views of the German zoologists on your zoological garden. The article mentioned is incomplete, for the reason that it does not do justice to the many superior features.

"Among all existing zoological parks, there is none in which the animals are found in such absolutely natural conditions as here in New York. The extent of the ranges for deer, bison, etc., and the imposing flying cage, had the undivided admiration of all the scientists present. Added to this is the great number of interesting forms of animals, especially of the American fauna, and last but not least, is the surprisingly large number of individuals.

"The past attainments give a guarantee that the New York Zoological Garden, upon completion, is sure to take a specially pre-eminent position among institutions of its kind."

(Signed) Professors Braun, Heymons
and Bogert.

The latest critical opinion on the New York Zoological Park is that of Dr. Walther Schoen-

ichen, of Berlin, which appears in an article on this institution published in the last number of "*Aus der Natur*," with illustrations. Two of its paragraphs are as follows:

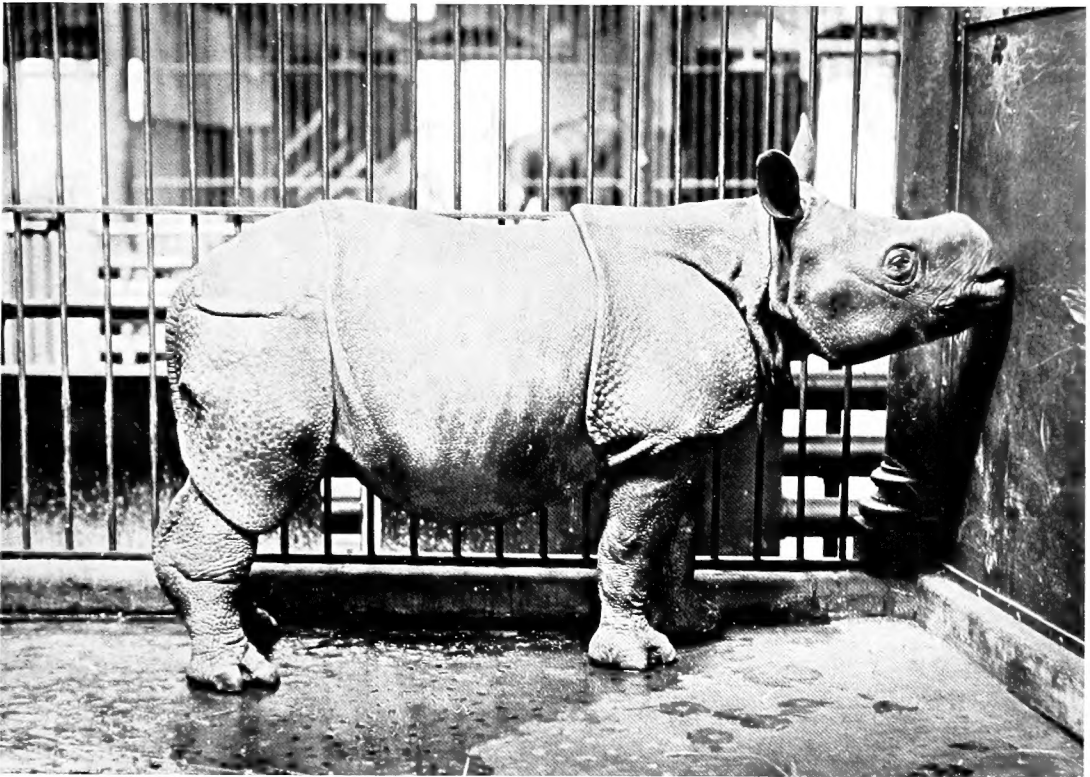
"There are few places in the world where all desirable conditions have been fulfilled in so excellent a manner, as in the Zoological Garden in New York. Although it has existed only the short space of time since 1899, already it belongs with the most prominent institutions of its kind, and when all of those installations which are now in the course of preparation have been finished, it will surely be the grandest and most beautiful garden in the world.

"The farsightedness and devotion with which the Zoological Society has fulfilled this duty, is not the last thing which must fill the visitor to this grand animal park with admiration and inspiration."

W. T. H.

INTERESTING ANIMAL SURGERY.

ON May 28, 1908, an interesting and unusual operation—that is unusual in the animal world—was performed on our Indian Rhinoceros, "Mogul," by Dr. George G. Van Mater, of Brooklyn, for cataracts in both eyes. The operation, in medical parlance, is termed "needling," and is primarily a rupturing of the crystalline lens, allowing the humor to escape



INDIAN RHINOCEROS, "MOGUL."

into the anterior or aqueous humor, where a process of slow absorption takes place. A cataract is not, as most people suppose, a growth over the ball of the eye, but a gradual change of the humor in the crystalline lens, to a milky opacity, eventually destroying the sight. "Mogul" was captured in 1906, and upon his arrival at the Park, it was noticed that the right eye had been injured. Gradually the defect communicated itself to the left eye, in time rendering the animal nearly blind. Dr. Van Mater diagnosed the case as cataract and advised the "needling" operation which is only practicable in soft or young growth cataract. "Mogul" was cast, by means of combination side lines and hobbles, with considerable difficulty, requiring the united aid of Drs. Blair, Ryder and Ellis, and a number of the keepers, to effectually subdue him. Dr. Gwathmey administered the anesthetic, using a mixture of chloroform and ether. Fully an hour elapsed before the animal succumbed, exhausting in its struggles one and one-half pounds of chloroform and three-quarters of a pound of ether. As is quite well known, the eye is the surgeon's index of the patient's condition under anesthetics, and as

this was the point of operation, it was then necessary to resort to local anesthesia, rendering Dr. Gwathmey's task a difficult one. Dr. Van Mater then punctured both capsules with a delicate knife of peculiar and ingenious construction. The incision in the cornea was a thin slit, but after penetrating the front of the crystalline lens, the blade was turned in the handle, as it was drawn back, making a T shaped cut, which allowed the humor to flow into the anterior chamber. The blade then being turned back on its axis necessarily passed through the cornea in exactly the same place as it entered, effectually preventing the thin humor of the anterior chamber from escaping. The operation was bloodless and painless. The animal, despite the enormous amount of anesthetic taken, was standing upon his feet within forty minutes after the operation. He is recovering the use of the left eye. The right one, being an advanced growth, is yet cloudy.

The work consumed nearly three hours, and the services of the operating surgeons, Drs. Van Mater and Gwathmey and their assistants, Drs. Ryder and Ellis, were gratuitous.

E. R. S.



JAPANESE RED-FACED MONKEY AND YOUNG.

NOTES.

Zoological Park.

Japanese Red-faced Monkey.—One of the very interesting young animals this year is a Japanese red-faced monkey, born at the Small Mammal House on June 4. The parent is one of several which has lived out of doors the year 'round. The tenderness, if her savage vigilance can be construed into that, is remarkable. No movement of the little animal escapes her. If he wanders a few steps from her side, she follows at once, and at the slightest demonstration from a spectator, clutches him close to her breast, ready to retreat. The young animal clings tightly underneath to the long hair of the mother, and is carried rapidly and easily. The little fellow is covered with black hair and bears very trifling resemblance to the parent.

Nesting-Birds.—The fearlessness with which the birds nest in most accessible places is becoming more marked each year, and is a gratifying evidence of their sense of the protection afforded them. In the bay trees on Baird Court, a song-sparrow and a purple grackle are rearing young broods, and not far distant one of the small lindens shelters a robin. On the walk back of the Elephant House a wood thrush has a nest in a small horn-beam, with a young brood. A pair of humming birds have elected to choose the store yards back of the shops as a summer home, and in defiance of the turmoil

are cheerfully raising a family. Vireos and robins live in harmony in a small oak at the conservatory entrance, and in the cornice brackets of the Service Building and the facade of the Mammal House, in conspicuous places, two robin broods have already been reared. The nest at the Service Building is now occupied by some English sparrows. Two young vireos, just leaving the nest, were observed near the Polar Bear Den, and farther along Beaver Valley a wood thrush was running about under the shrubbery followed by her young offspring. A swallow has fastened her nest to the wall of the sleeping den of the Polar Bear and at this time has not been disturbed. A wood-duck made her nest high up in an oak tree in the Beaver Pond, but was disturbed by squirrels, and gave it up. The Canada geese have raised several goslings and the mallard ducklings on the wild-fowl pond are a legion.

The Wichita Bison Herd.—The last news from the Wichita National Bison Range reported the herd in first-class condition, and the outlook for the future entirely satisfactory. The two calves born on the range are doing well. An effort is being made to procure a few elk to introduce in the range, and it is reasonably certain that this plan will be carried into effect at an early date.

Heads and Horns.—The number of gifts to the National Collection of Heads and Horns that have been received during the past year entirely surpasses the most sanguine expectations of the founders of the Collection. Both in number, and in zoological value, the array is most gratifying. The future of the Collection is now quite beyond the pale of doubt. A number of sportsmen of international reputation have sent some of their finest and most highly prized trophies; and in Alaskan heads and horns the Reed-McMillin Collection is fairly beyond compare. Part II. of the annual Heads and Horns publication, now in press and soon to be mailed to all members of the Zoological Society, contains notices of all the gifts received during the past year.

Births.—During 1908 the births among the mammals of the Park have been unusually numerous and important. A partial enumeration reveals the following species: Rocky Mountain goat, Beatrix antelope, mouflon, Spanish ibex, South American tapir, Burmese thameng, barasinga deer, sambar, axis, fallow, sika, mule and white-tailed deer, elk, Bactrian camel and American bison.

Aquarium.

White Perch as Destroyers of Mosquito Larvæ.—During the last week of May some of the employees of the Aquarium were sent to the lake in Prospect Park, Brooklyn, to collect specimens of black bass and white perch for exhibition at the Aquarium. The large seine which was used brought in hundreds of young perch, a few of which were injured by being "gilled" in the meshes of the net. Mr. W. I. DeNyse, who was in charge of the collecting party, observed the young perch to be distended with food which on examination was found to consist chiefly of the larvæ of mosquitoes.

This observation is important in view of the increasing interest taken in fishes useful in combating the mosquito nuisance. The white perch is a fish of the coastal waters, ascending streams to spawn. Although chiefly a marine species, it can be kept permanently in fresh water, where, however, it does not attain so large a size. As it is an excellent food fish, the fact that the young are active feeders on mosquito larvæ will be of special interest to persons selecting fishes for private ponds.

Attendance.—The winter attendance at the Aquarium has been larger than ever before; the number of visitors from January 1 to April 30 inclusive having been 666,525, an average of over 5,500 a day. Heretofore the attendance for the first quarter of the year has but once exceeded half a million and has seldom exceeded 450,000. This winter's record serves to indicate that the year's attendance will far exceed the two-million mark passed two years ago.

Increasing Use of Carp.—The carp problem in this country is being gradually solved by the commercial fishermen who are sending this fish to market in greater quantities each year. The statistics of the U. S. Fisheries Bureau place the annual catch of carp at about twenty million pounds.

The greater part of the catch of carp is made in the Mississippi River and its tributaries, where the annual yield exceeds twelve million pounds, half of this total being derived from the Illinois River.

Over four million pounds of carp are taken from the Great Lakes, three and a half millions coming from Lake Erie alone. In other parts of the country the carp is not yet being taken in very large quantities for market purposes, although the Middle Atlantic States contribute over a million pounds.

The greatest development of the carp fishery is taking place in Ohio and Michigan, the fish being taken from Lake Erie and Lake Michigan. The fishermen of Illinois have been making money out of the carp for several years and have been supplying a large part of the seven or eight million pounds used each year in New York City. There are now several other good markets for carp, which the fishermen are supplying at a fair profit. In many places along the Ohio shore of Lake Erie the fishermen are enlarging the ponds they have for some years been using for retaining carp taken from the Lake. The carp are caught in immense quantities, which makes it profitable to handle them at a low price and are shipped whenever the conditions of the fish market are favorable.

Large Sea Turtle.—On June 3, the Aquarium received a large Leather-back turtle, (*Der-mochelys coriacea*) from Bayhead, New Jersey, where it was captured. The specimen weighed 750 pounds and measured six feet and five inches from beak to tail. The top shell, along the median ridge, was five feet long. Unfortunately it did not reach the Aquarium alive, although apparently without external injuries of any kind.

The Leather-back is the largest of all the marine turtles. Unlike most of the other species it does not live long in captivity.

The New Salt Water System.—The New York Aquarium is now using its new salt-water system known as the *closed circulation*. Pure sea water, brought in tanks from the ocean, and stored in a reservoir, is pumped to the distributing tanks on the upper floor, whence it flows through the exhibition tanks and then through gravity filters back to the reservoir.

The new reservoir—holding 100,000 gallons of stored sea water—and the new filters, have been quietly under test for three weeks, and have given entire satisfaction.

This is the most important change that has yet been made by the Zoological Society in methods of operation at the Aquarium. It means that the exhibition tanks containing marine species will hereafter be supplied with *real sea water* instead of the brackish, sewage-laden water of the Harbor. It means also that the high death rate among the sea fishes and invertebrates due to polluted water, will be done away with, and that the exhibition of many forms of marine life new to our collections will be made possible. During the month of July the marine exhibition tanks will be re-stocked.

C. H. T.

ZOOLOGICAL SOCIETY BULLETIN.

EDITED BY THE DIRECTOR
Elwin R. Sanborn, Asst. Editor

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No. 30

JULY, 1908

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MAILED FREE TO MEMBERS.

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Payne Whitney,

THE PASSING OF THE WHALE.

The attention of all persons interested in the conservation of the animal resources of the world, is especially directed to the article by Mr. Lucas on "The Passing of the Whale," published as a supplement to the present number of the BULLETIN of the New York Zoological Society. It is a truthful statement by one of the best-informed students of the subject. The valuable whale is unquestionably going fast—faster than the valuable fur seal—and soon may be classed with the sea otter, American bison and other wealth-producing animals whose commercial value has been lost to man. As a source of wealth the whale is the most important of all.

Steps have been taken by the Zoological Society to place the information contained in this article before legislative bodies in many parts of the world.

The Society as a scientific association devoted to the preservation of wild animals, earnestly requests the careful consideration of it by every legislator into whose hands it may come.

C. H. T.

BISON SOCIETY SUCCESSFUL.

The Montana National Bison Range is now, to all intents and purposes, an accomplished fact. Congress has promptly and cheerfully entered into the plan of the American Bison Society for joint action by the government and the Society in the creation, on the Flathead Indian Reservation, of a great national herd of pure-blood American bison, perpetually endowed with a range of 20 square miles of good grazing grounds.

The quick success of the campaign in Congress has been almost phenomenal. Five years ago, it would have been impossible for any man or body of men to have succeeded in inducing Congress to appropriate as large a sum as \$40,000 for the preservation of any species of wild animal other than the fur seal. But the sentiment in favor of wisely conserving the resources of nature has lately aroused many men who previously had not paused to consider that subject.

Owing to the absolute necessity of paying the Flathead Indians for the lands desired, an appropriation of \$30,000 has been made, and for fencing the range a fund of \$10,000 has been provided. It is a reasonable certainty that the range chosen by the Bison Society and formally proposed to Congress, will be selected; and it will be known hereafter as the Montana National Bison Range.

In order to provide means for the purchase of the herd of about forty pure-blood bison which it has agreed to present to the government, the Bison Society is now setting out to raise, by a great popular subscription which is to cover the whole United States, a fund of \$10,000. Every state and territory will be invited to contribute toward the creation of the Montana national bison herd. This campaign is in charge of Dr. W. T. Hornaday, with headquarters at the New York Zoological Park, who invites every American citizen to subscribe, any sum from \$1 upward, and do it now.

THE SPECIAL ANIMAL FUND.

Because of the absorption of more than \$17,000 from our Animal Fund in payments for rhinoceroses, elephants, and other thick-skinned

but expensive animals, the general collection of smaller mammals was well-nigh totally ignored for nearly eighteen months! At last certain gaps caused by the death of short-lived species became so apparent as to be unendurable. Inasmuch as the members of the Board of Managers were called upon for \$10,000 for the current expenditures of the Society, it was deemed impossible to repeat the call upon them, even for animals.

The case being particularly desperate, the Director of the Park received authority to raise a much-needed animal fund as a special subscription. In view of the fund raised by the annual members a short time ago, it seemed necessary to limit the call to the life members of the Society, and a very few others. The case was stated without any reservation, and an effort was made to secure \$4,000.

In view of present financial conditions, and the extra-heavy demands that are being made upon all men and women who give money to worthy objects, the responses up to date have been extremely gratifying. The following subscriptions have been received up to June 20:

| | |
|----------------------------------|---------|
| Charles H. Senff..... | \$1,000 |
| Robert S. Brewster..... | 500 |
| Andrew Carnegie..... | 500 |
| Edward S. Harkness..... | 500 |
| G. S. Bowdoin..... | 200 |
| Henry Phipps..... | 100 |
| James B. Ford..... | 100 |
| Zenas Crane..... | 50 |
| George D. Pratt..... | 50 |
| H. C. von Post..... | 50 |
| George B. Hopkins..... | 50 |
| Oliver G. Jennings..... | 50 |
| J. P. Morgan, Jr. | 50 |
| David Lydig..... | 50 |
| W. R. Coe..... | 50 |
| William Church Osborn..... | 50 |
| Samuel P. Avery..... | 25 |
| Mrs. Farquhar Ferguson..... | 25 |
| Lloyd Phoenix..... | 25 |
| John J. Pierrepont..... | 25 |
| Mrs. William Gilman Nichols..... | 25 |
| Dr. L. Haupt..... | 10 |
| R. P. Lounsbery..... | 10 |
| Samuel Riker, Jr. | 10 |

\$3,505

Balance urgently needed..... 500

Never in the history of the Society have subscriptions been more welcome than these. Up to this date the following animals have been purchased, to fill up gaps in the collections:

3 Alpine Ibex, breeding adults.

- 1 Polar Bear.
- 1 Hamadryas Baboon.
- 2 South African Ostriches.
- 2 Dingoes.
- 1 Binturong.
- 2 Prong-Horned Antelopes.
- 1 South American Wild Dog.
- 1 Black Ape.
- 2 Wanderoo Monkeys.
- 4 Marmosets.
- 1 Black-Footed Ferret.
- 6 Black and Fox Squirrels.
- 1 Mexican Red Squirrel.
- 3 Beavers.
- 2 Otters.
- 1 Stone Marten.
- 4 European Red Foxes.
- 5 Hedgehogs.
- 3 Roe Deer.
- 1 European Squirrel.
- 3 Canada Porcupines.
- 1 Humboldt Woolly Monkey.
- 6 Coypu Rats.

W. T. H.

LAWRENCE WARBLER IN CAPTIVITY.

One of the most interesting results of this spring's collecting in the Bird Department, is the acquisition of a male Lawrence Warbler in full plumage, (*Helminthophila lawrencei* Herick). It will be remembered, that in 1904 the Curator reported the fact that a Lawrence Warbler mated with a female Blue-winged Warbler, had a nest and six unfledged young in the Zoological Park.* These nestlings subsequently flew in safety and the nest is now in the collection of the Zoological Society.

On May 13 of the present year the Lawrence Warbler now living in the collection was trapped in the Park almost on the very spot where the nest was located four years ago. This is merely circumstantial evidence but it rather favors the theory that the bird is either the male parent bird or one of the young of the former brood. Each spring since 1904 careful search has been made in this vicinity but nothing has been seen of Lawrence Warblers, although Blue-Winged Warblers breed there regularly. The warbler collection bids fair to be ahead of that of any former year, there being now about twenty living species on exhibition. If the Lawrence and a Blue-wing can ever be persuaded to nest in captivity the long-contested question of the status of the former, whether a hybrid, a valid species or one in the process of formation, will be settled once for all.

C. W. B.

*See Zoological Society Bulletin No. 14, page 165, and No. 15, page 181.



EAST AFRICAN LIONS "SAMBOUT" AND "SERGOIT."
Presented by Mrs. Armar D. Saunderson.

TWO LIONS FROM AFRICA.

THE most valuable and desirable of all lions, young or old, are those to which can be applied the magic word "imported." This term signifies a jungle-bred animal, with a wilderness constitution, and all the stamina that wild paternity can impart.

The Society has recently received from Mrs. Armar D. Saunderson two fine male lion cubs that belong in the "imported" class. They were captured by Mr. and Mrs. Saunderson on February 20, 1908, in the southwestern corner of British East Africa, when about two weeks old. The mother lioness had four cubs in all, two of which she managed to carry off to a safe retreat before the hunting party arrived.

The two cubs captured were taken to Mr. Saunderson's camp, and hidden in a pile of saddles and boxes. For several nights the mother prowled about the camp, roaring at intervals, but finally she abandoned her efforts to recover her offspring.

Both the cubs are males, and have been named "Sambout" and "Sergoit," after two large rocks

that rise out of the Guas N'Guishu plateau. For several days following their capture they were fed on warm milk, to which was presently added a midday meal of raw meat that had been put through a mixing machine. They were carried in two chop boxes, on porters' heads, for over 100 miles to the Uganda Railway, and came to New York by way of Mombasa, Marseilles and England.

"Sambout" and "Sergoit" will be quartered in one of the large eastern cages of the Small-Mammal House until they are old enough to go to the Lion House. They are very docile and affectionate animals, and are taken out by their keepers for a daily walk, in collar and chain.

Dancing Cranes.—A stranger might imagine the cranes were crazy or affected by the heat if he came upon them during play time, and apparently that is what it can be termed. The Sandhills dance around in a circle, jumping about in the most grotesque way with outstretched wings and necks, continuing for

lengthy periods, usually terminating the performance by a wild flight down the range. But the Asiatic white crane has two tricks which he performs with idiotic abandon and punctilious care. He selects some spot in the range, and bores a hole into the turf with his mandibles; standing over it he pumps his head up and

down, until one wonders how long he can keep it going. If you go away and return in one hour, as I did, you will find him still at it. Again he seizes a feather in his beak and tosses it into the air, and as it falls leaps for it and catches it, repeating the trick, as the keeper told me, for over an hour at a time.

CENSUS OF AMERICAN BISON, JANUARY 1, 1908, OF PURE BLOOD.

| | MALES | FEMALES | CALVES IN 1907 | TOTAL ON JAN. 1, 1908 | TOTAL IN 1903 |
|--|-------|---------|-------------------|--------------------------|------------------|
| Captive in the United States | 506 | 610 | 203 | 1116 | 969 |
| Captive in Canada | 214 | 262 | 98 | 476 | 41 |
| Total in America | 720 | 872 | 301 | 1592 | 1010 |
| Captive in Europe | 54 | 76 | 22 | 130 | 109 |
| Total in Captivity | 774 | 948 | 323 | 1722 | 1119 |
| Wild Bison in the United States, Estimated | | | | 25 | |
| Wild Bison in Canada, Estimated | | | | 300 | |
| Total pure blood Bison, Jan. 1, 1908 | | | | 2047 | |
| Number of owners of pure blood Bison, in America | | | | 45 | |
| Number of owners of pure blood Bison, in Europe | | | | 19 | |

BUFFALO-DOMESTIC HYBRIDS, "CATTALOES"

| | 1907 | 1908 |
|------------------------------------|------|------|
| In the United States | 260 | 243 |
| In Canada | 57 | 17 |
| In Europe | 28 | 21 |
| Total on January 1, 1908 | 345 | 281 |

DOCILE WILD ANIMALS.

By R. L. DITMARS.

IN every collection of animals there is always a number of individuals that particularly interest the keepers. The men usually designate such examples as "pets," although not all of them are to be altogether trusted as are most members of that ever-interesting class. In fact, a few mammals sometimes gain a species of favoritism through a display of extreme ugliness.

There are now living in the Zoological Park a considerable number of animals which the keepers term "pets." The Small-Mammal House contains the most interesting assortment of them. It was at this building, but a few days past, that Mr. Sanborn endeavored to photograph a "rounding up" of the keepers' favorites, but owing to the attempted association of members of such widely different orders

as the Carnivora, Rodentia and Edentata, the proposed group prepared for a battle royal. In deference to a strong prospect of a lively scrimmage, the attempt at making a photograph was abandoned.

In the Small-Mammal House the most amusing pets are a South American wild dog, two dingoes, a badger, several civets, an agouti, a Malabar squirrel and an armadillo. When the keepers of that building are cleaning their cages in the early morning, most of the animals mentioned have the free run of the building, although the men are necessarily careful not to thus exercise those of their pets that might injure each other. The badger and the agouti are absolutely to be trusted not to stray away, and are permitted to run at will outside the Small-Mammal House. It is not unusual for an excited visitor to report at the Small-Mammal House that he has met a strange-looking animal ambling along the path, that had



BACTRIAN CAMEL AND YOUNG.

The young animal was born in the Zoological Park April 6, 1908. At the time of birth it was so helpless that it was necessary to lift it to the mother in order that it might nurse.

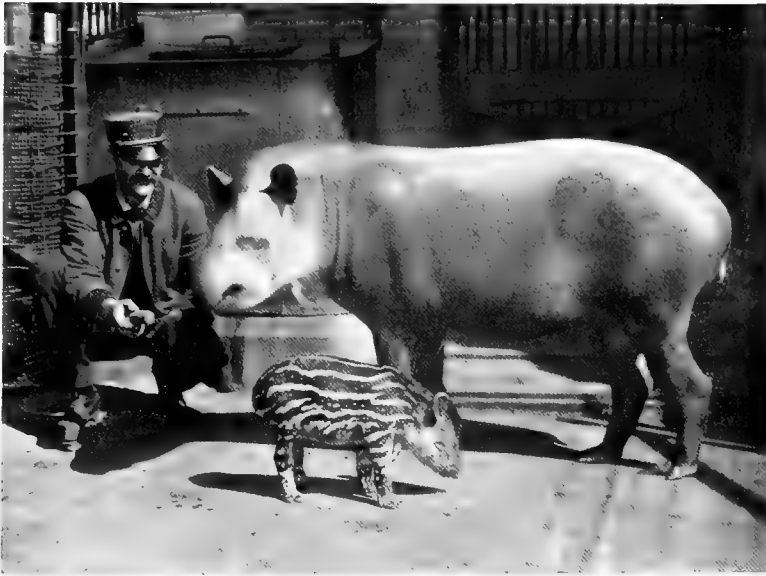
stopped and chattered in an alarming manner. This is always the badger, which noisy little creature often comes as far as the Reptile House, always prompted by an untiring appetite.

Here, alas for romantic writers, it must be explained that much of the docility among animals is prompted by appetite and selfish interest. This accounts for some of the friendly advances of deer and other hoofed animals, many of which will treacherously attack one in the corral. With most of the "tame" flesh-eating animals, the sight of food effects a startling change in temper. The amusing little badger is a veritable demon when given his food, and continues to growl over the bone for hours afterward. Not all, however, among our keepers' special favorites are thus influenced by appetite.

Quite an exception to the former rule is a fully grown golden agouti, living in the Small-Mammal House. The agouti belongs to a group of rodents known as the Cavies. Nearly all of them are uniformly good natured, even to that gigantic creature, the capybara, which is as big as a large pig, and has teeth strong enough to instantly amputate a man's finger.

The agouti in question often runs free about the Small-Mammal House like a miniature deer. It obeys the call of keepers Kane and Landsberg, and permits the men to lift it back to its cage. In an adjoining cage is a large Malabar squirrel, which, when turned loose, seems to actually tease the men as they try to get it back, but when a step-ladder is brought the creature evidently reasons that the game is at a close; for it immediately darts for its cage door.

The most important and interesting of the Park's tame animals are the fine lion cubs Sambout and Sergoit, presented by Mr. and Mrs. Armar D. Saunderson. At present, the keepers are taking these animals for a daily walk over the lawns, each one controlled only by a collar and chain. But the friendly spirit of these lions soon will change. When about eleven months old, the cubs of nearly all the big cats become vicious and unmanageable, unless subjected to constant handling and training, the latter usually involving quite vigorous treatment, and much nerve on the trainer's part. Even today, these small lions will suffer no human interference at feeding time.



SOUTH AMERICAN TAPIR AND YOUNG.

The young tapir was born April 22, 1908. Both the old and young are extraordinarily docile and very fond of any attention from the keepers.

In the Primate House are creatures that so closely parallel humanity, both in action and structure, that it seems inappropriate to speak of them as "wild animals." Young orang-utans and chimpanzees are like children. They insist upon throwing their arms about the keepers' necks, to be carried about, and when the men finally insist upon putting them down, they scream lustily, or bump their heads against the cage floor in infantile rage. Almost anyone can handle these young anthropoid apes, but in the Monkey House there are many other animals of very different temper.

From the visitor's point of view, one of the most vicious monkeys in the building is a big Japanese red-faced monkey. This creature often shakes his cage front, gripping it with both hands, and using all his strength. Such exhibitions are followed by what the brute evidently intends to be an illustration of what he would do if he had the chance. It consists of placing his hand in his mouth, and biting at it quite savagely. Strange to say, this demoniacal creature is perfectly gentle with his keepers. By assisting him to walk upright, he can be led about like a child. He is under such perfect control that the men never have taken a stick or whip into the cage. A mild cuff with the hand, delivered by keeper Reilly or Engeholm, causes the sour-visaged brute to whimper and cringe, but the instant the men close the door and leave

the cage, Jake hurls himself at the bars as if to avenge an imaginary insult from a visitor.

As examples of actual affection among mammals, we might select a woolly monkey and a spider monkey, both on exhibition in the Primate House. At the rattle of the lock these animals spring for the cage door. The keeper barely has a chance to open the door when a pair of long arms are wound about his neck and the man finds himself in much the same predicament as Sinbad. It is only with the help of an associate that the burden can be dislodged. Ordinarily, Keeper Reilly carries the strange woolly monkey about with him, slung over his back, rather than provoke the chorus of ear-splitting shrieks that would follow if the monkey were at once forced back into its cage.

A considerable degree of docility is to be observed among the inmates of the Reptile House. There is a big Cuban iguana quartered in the north corral of the Lizard and Tortoise Yards, which is so fond of Keeper Toomey that whenever the latter enters the corral the reptile rushes to him, crawls up his back and to his shoulders, where he perches contentedly. Nor is this creature's interest in his keeper prompted by appetite; for he behaves the same immediately after feeding time, when all of the iguanas are so gorged they refuse further food. The big tortoises are also docile, following their keeper about their corral, but in them there is so marked a decrease of interest after feeding



YOUNG MEXICAN PUMA.

One of a pair of pumas which were sent to the Park, arriving in a very emaciated condition. It is thriving on milk fed from a bottle.

time that little or no affection may be attributed to their movements.

First-Keeper Snyder has a number of charges which he classifies as pets. Most of the alligators take their food from his hand, and there are a number of snakes that invariably come to the door of the cage when open and crawl about the keeper. With all of the serpents, appetite is usually the cause of their interest in the keeper, though the desire of an occasional specimen to get out of its cage will cause many visitors to remark upon the snake's great joy at beholding the keeper at the open door.

The king cobra is possibly the "favorite" in the Reptile House; but here favoritism comes from an extreme display of craftiness and ferocity! This dangerous serpent has been on exhibition about nine years, and is just as vicious as the day he was received. He is always ready to strike his keeper, and would never miss the opportunity if the chance was presented. A display like this, of a really dramatic rage, is always appreciated by the keeper. It is the listless animal, lacking both signs of docility or real hostility, that is looked upon with disfavor.

A WHITE RHEA.

THE Rhea is the most graceful of all the ostrich-like birds and the most interesting to us as being the only representative of these birds in our hemisphere. It inhabits the level,

prairie-like pampas of South America and its enemies are chiefly the jaguar and the puma. From these it is protected by its tall stature, giving it a wide outlook, its dull gray plumage and its keen eyesight. Unfortunately these qualities are of no avail against the attacks of men, and unless means of protection are found the Rhea will soon become extinct.

White birds are occasionally seen and the Zoological Park has recently acquired one which in beauty excels all the other inmates of the ostrich house. In a wild state, a bird of this color would have short shrift, and as it walks about its range we can readily perceive how easy it would be for the enemies of the bird to detect it at a distance; its white, fluffy plumage standing out in sharp silhouette against the green grass. The eyes are not pink as in ordinary albinos but pale blue.

Although the two Rheas already in the collection are a true pair and from time to time lay beautiful golden eggs, yet they willingly accepted the newcomer and showed no display of the fierceness which characterizes most other birds of this group.

A pair of One-wattled Cassowaries which arrived with the Rhea, fought so fiercely that they had to be separated, and even then continued their altercation through the fence so that it was necessary to remove them from each other's sight.

C. W. B.

A SCIENTIFIC EXPEDITION TO THE DELTA OF THE ORINOCO.

ON the 22nd of February, 1908, Mrs. Beebe and the writer sailed on the Royal Mail S. S. "Trent" for Trinidad, off the northeast coast of South America. Our chief object in taking the trip was to study and photograph something of the wild life of South America and to obtain alive some of the interesting birds of that continent for the collection of the Society. In both we were decidedly successful.

On the way south we touched at Kingston, Colon, Savanilla and La Guira, spending from one to three days at each port. Desolation is the impression one carries away from Kingston; the vulture-haunted ruins of the earthquake of a year ago, remaining almost untouched. We found that Sunday at Colon is a day of absolute cessation of all work, but we were fortunate in securing a special train which took us across the Isthmus. Cleanliness, and the evidence of rapid and thorough progress compelled our attention everywhere. It was play day, and along the route pony racing and baseball alternated with ranks of vine-covered engines (relics



WHITE SOUTH AMERICAN RHEA IN THE ZOOLOGICAL PARK.

of the French occupation), hundreds of neat, mosquito-screened houses and vistas of the gigantic ditch.

Savanilla presented the antithesis; a collection of tumbled-down, dirty, thatched huts scattered about in a desert. But there were compensations—of a kind. If one purchased a train ticket for 20 cents and paid with a five-dollar American note, one's change would be a large roll of yellow bills, aggregating \$180—in Colombian money. A Colombian dollar at this time exactly equalled an American cent! It was surprising to see ragged soldiers sitting in the streets, gambling away bills of large denominations.

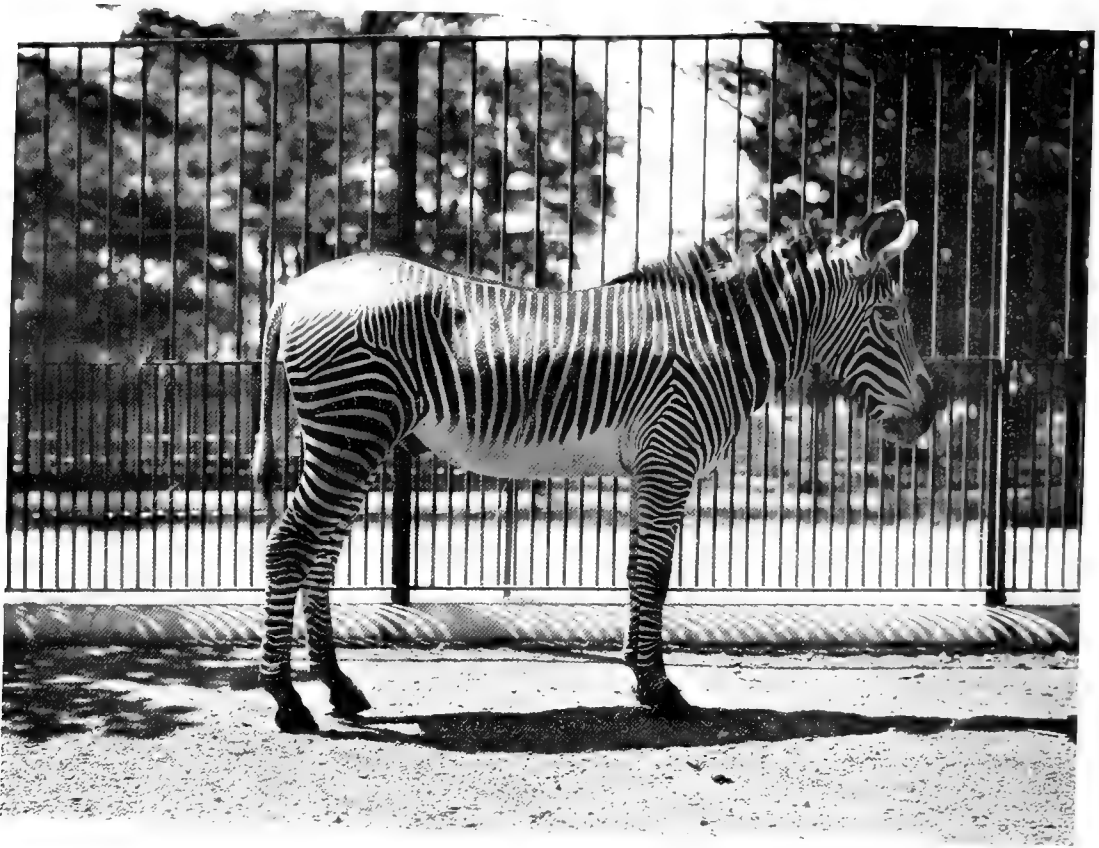
At La Guira one gives no thought to the town itself, which is a typical Latin seaport, but is lost in admiration of the wonderful mountains which tower upward for thousands of feet almost sheer from the water. It is the grandest part of the whole Spanish Main.

Port-of-Spain, the capital of Trinidad, we found a most wide-awake and American-like city and the citizens hospitable and kind. We were delayed there a week or two, but at last were able to charter a twenty-one ton sloop and

with a captain, cook, and crew of three, we sailed westward under the Venezuelan flag, headed for the northern part of the Orinoco delta.

From now on we were in the midst of primitive nature and our results group themselves naturally under two heads: first, the aboreal and aquatic life of the vast expanse of mangrove swamps, and second, our studies of the peculiar fauna and flora of La Brea, the pitch lake of Venezuela, which represents the very beginning of the high land adjoining the mangroves. Of the pitch lake we had heard a good deal politically, and from a natural history point of view we found it intensely interesting. These results will be worked up as quickly as possible and published by the Society.

Some two hundred excellent negatives were secured of flowers, insects, fish, birds and Indians. A collection of forty living birds and two arboreal porcupines were brought back, all arriving safely and in good health in New York. All the species of birds are new to the collection. Besides these, several hundred specimens of bird skins, embryos, eggs, fish and insects were collected.

GREVY ZEBRA, *EQUUS GREVYI*.

Most interesting among the living birds are the sun bittern, scarlet ibis, white-faced tree-duck and kiss-ka-dee tyrant flycatchers, besides several species of beautiful tanagers.

Perhaps the most important result of the expedition is the arrangement which was made with several gentlemen to send shipments of live birds and animals in the future to the Zoological Park, at the mere cost of capture and shipment. Men on board regular steamers plying between Trinidad and New York were instructed in the care of birds and the interest of the captains aroused. It is hoped that the wonderful bird life of South America may, before long, be represented by a splendid series in our Zoological Park.

C. W. B.

A RARE ZEBRA.

THE Zoological Park has very recently acquired a fine male specimen of a most uncommon equine species known as the Grevy Zebra, (*Equus grevyi*), so named in honor of an ex-President of France. It is not

only one of the rarest zebra species, but it is also one of the largest and most showy. It is strongly characterized by its large size, its complete suit of very narrow black and white stripes, of generally uniform width, and its large ears. Its stripes extend quite down to its hoofs.

This very handsome animal is found in southern Abyssinia and northern Somaliland. Thus far, practically all the specimens that have reached Europe and America have come from Abyssinia, and several of them have been sent out by King Menelik. The total number in captivity, outside of Africa, is probably about fifteen. The value of *Equus grevyi* has been high, usually \$2,000 per head, or even more, but there is likelihood that this figure will sensibly diminish.

For the present, our specimen will be found in the Antelope House. We now exhibit five species of equines, as follows: Grevy zebra, Grant zebra, Chapman zebra, Persian wild ass and Prejevalsky horse.

W. T. H.

ZOOLOGICAL SOCIETY BULLETIN

No. 30

Published by the New York Zoological Society.

July, 1908

THE PASSING OF THE WHALE.

By FREDERIC A. LUCAS.

Curator in Chief of the Museum of Arts and Sciences of the Brooklyn Institute.

THE attention of all persons interested in the conservation of the animal resources of the world, is especially directed to the article by Mr. Lucas on "The Passing of the Whale," published as a supplement to the present number of the BULLETIN of the New York Zoological Society. It is a truthful statement by one of the best-informed students of the subject. The valuable whale is unquestionably going fast—faster than the valuable fur seal—and soon may be classed with the sea otter, American bison and other wealth-producing animals whose commercial value has been lost to man. As a source of wealth the whale is the most important of all.

Steps have been taken by the Zoological Society to place the information contained in this article before legislative bodies in many parts of the world.

The Society as a scientific association devoted to the preservation of wild animals, earnestly requests the careful consideration of it by every legislator into whose hands it may come.

C. H. T.

The New York Zoological Society at its Annual Meeting in January adopted a resolution relative to the protection of whales by international agreement.

The idea that the preservation of whales was necessary and desirable was new to many members of the Society. This was perhaps natural as whales and whaling industries do not come under the observation of the average citizen. Yet whales as economic animals have been and continue to be of immense value to man. They are of the greatest possible interest zoologically,

since they are the largest of existing animals. One species—the Sulphur-bottom whale—attains a length of eighty feet, being of greater size than the extinct dinosaurs, the largest of the wonderful animals of the past.

From a strictly American viewpoint the whale deserves serious consideration as it was half a century ago the basis of an industry which brought great wealth to the New England States. In the days when the whale fishery was most important there were over six hundred American ships and many thousands of men regularly engaged in that industry.

During a period of nearly fifty years prior to about 1872 the value of whale oil and whale-bone landed by American vessels, amounted to more than 270 millions of dollars.

Subsequently the whaling industry as conducted from vessels gradually declined. The present method of whaling from shore stations is of quite recent introduction.

It is a startling fact that nearly all species of whales are threatened with early extinction by reason of the destructiveness of modern methods of whaling, practiced chiefly from stations located on shore.

The protection of whales is therefore necessary if any whales are to be left for future supply. How rapidly whales of all kinds, save possibly the Sperm whale, are disappearing before the attacks of man, may be inferred from a glance of the shore-whaling industry and particularly at that of Newfoundland, whose statistics are most readily available and where the effects of modern methods are most apparent.

Before 1903 we have no data as to the number of whales taken along the coast of Newfoundland and can only say that the value of whale products rose successively from \$1,581 in 1898, to \$36,428 in 1900, and \$125,287 in 1902. Making a rough estimate, based on the value of the products of the whale fishery, one may say that this represents not less than 350 whales, more probably about 500, since prior to 1902 the waste was very great. The first whaling station in which modern methods were adopted was established in 1897 and its success was so great that in 1903 four others had been erected and three more planned, although but three steamers were then employed. R. T. McGrath in the Report of the Newfoundland Department of Fisheries for 1903, gave it as his opinion that no more applications for factories should be granted for some years to come, saying "Two factories are about to be erected, one at Trinity and one at Bonavista—during the coming year. This will make eight factories in all, viz., Balena, Aquaforte, Snook's Arm, Chaleur Bay, Cape Broyle, Bonavista and Trinity. In my opinion no further applications should be granted for some years. If licenses are given without restriction, it will result in complete depletion of this industry within a short time; whilst if judiciously dealt with, it will be a profitable source of revenue, and a great assistance to the laboring people of the colony for many years to come." This advice, however, was not heeded, the only restriction placed on whaling being that stations should not be nearer one another than twenty miles and that but one steamer should be employed. These restrictions were practically of no avail as one steamer was all that could then be employed to advantage and a run of twenty miles is nothing to a 12-knot vessel. So whaling stations rapidly multiplied until by 1905 eighteen were in operation, occupying all the more favorable locations about Newfoundland, Labrador and the Gulf of St. Lawrence, and fifteen steamers were employed. The effects of this over-multiplication were felt at once, and while in 1903 three steamers took 858 whales, or an average of 286 each, in 1905 fifteen steamers

took but 892 whales or an average of only 59 a vessel.

| | | | | | |
|--|----|---------|-----------|-------------------|--------|
| In 1903 | 3 | vessels | took..... | 858 | whales |
| " 1904 | 10 | " | " | 1275 | " |
| " 1905 | 15 | " | " | 892 | " |
| " 1906 | 14 | " | " | 429 | " |
| " 1907 | 14 | " | " | 481 | " |
| | | | | <hr/> 3935 whales | |
| Taken between 1898-1902, estimated | | | | 350 | " |
| | | | | <hr/> 4285 whales | |

Thus in ten years more than 4,000 whales have been captured in the immediate vicinity of Newfoundland. The effect was disastrous and caused the ruin of the smaller companies, the chief sufferers being the smaller shareholders who had invested their entire capital.

One of the arguments in favor of indiscriminate whaling has been the theory that whales had the whole world to draw upon and that the depletion in any one locality would soon be supplied by overflow from another. To a slight extent this may be true for there seems some reason to believe that whales do now and then pass from the Pacific to the Atlantic* but on the whole whales are restricted in their range as other animals† and extermination in one place means extermination in that locality for all time. Another fallacy was the belief that the supply of whales was practically limitless and that one might "slay and slay and slay" continuously. There is not a more mischievous term than "inexhaustible supply," and certainly none more untrue. So we see our inexhaustible forests on the verge of disappearing, our inexhaustible supplies of coal and oil daily growing less, and the end of the inexhaustible supply of whales in sight. Man is recklessly spending the capital Nature has been centuries in ac-

*Capt. Bull states that a Sulphur-bottom whale shot on the coast of Norway contained a harpoon fired into it on the coast of Kamchatka and that a Humpback killed off Aquaforte was found to have in the flesh an unexploded bomb lance fired from a San Francisco whaler in the Pacific.

†For example, the Sulphur-bottom is not found or occurs as a straggler on the East coast of Newfoundland; although once common on the South coast.

cumulating and the time will come when his drafts will no longer be honored. It matters not whether the vessel is a bucket or an ocean, one can only take out as much water as it contains and where all is outgo and no income, it is merely a question of time when one or the other will be emptied.

The history of the Newfoundland whale fishery merely repeats what has taken place everywhere the whale has been hunted, the only difference being that owing to the limited area covered and the use of modern appliances results have been reached more quickly than in the days of sailing vessels and hand harpoons.

It is a matter of record how the Right whale was successively swept from the Atlantic coasts of Europe and North America, then from the North Pacific and finally from the Southern Seas, and what has happened in the case of this species will happen in the case of others.† The great Bowhead, owing to its restriction to a portion of the Arctic seas, and the ease with which it may be taken, is in a worse plight than his smaller relative and it is quite possible that the present generation will see its actual extermination.§ And yet this monster once flourished in such numbers that for nearly three centuries its capture gave employment to hundreds of vessels and thousands of men. How abundant this species actually was we can only surmise from the former size of the whaling fleet and the statistics of its catch, though the old-time wood cuts showing the chase of the whale seem not to exaggerate its abundance. The American whaling fleet at the time of its greatest activity numbered from 500 to more than 600 sail, while in England, our most active competitor, from 25 to 60 vessels cleared from the port of Hull alone and several other towns contributed to swell the Arctic fleet which comprised from 150 to 250 vessels.

†The writer is quite aware that this species still survives and, owing to the cessation of whaling for some years, has even increased in some localities. This increase is now being taken and in a year or two the species will again be at a low ebb.

§The possible extermination of the Right and Bowhead whales was foreseen as early as 1850, and comments made on the large number of whales lost by sinking and on the evil results of killing the Right whale on its breeding grounds.

The imports of whalebone into the United States from 1805 to 1905 were 81,985,655 pounds. Averaging 2,000 pounds per whale, a rather high estimate, this would represent no less than 40,804 Right and Bowhead whales taken by American whalers.

Taking the port of Hull, England, we know partly by the actual returns and partly by estimates based on the yield of oil, that the ships of this port between 1722 and 1820, took in Davis Strait and on the East Coast of Greenland, no less than 10,207 whales and a fair estimate of the total English catch would be about 20,000 Right and Bowhead whales, so that in two centuries not less than 50,000 were killed by English and American whalers alone.

But this is only a portion of the catch taken in the north, for as early as 1660 the Dutch sent 500 ships to the Spitzbergen fishery alone, and by the end of the century the number had risen to 2,000. Even though many of these were so small that now-a-days they would be looked upon as mere boats, the total catch prior to 1750 must have mounted into the thousands.¶

The contrast of these figures and the returns for the past two years show to what a low ebb the whales of this part of the world have been reduced, for in 1906 the catch of the Dundee fleet was but seven, and in 1907 only three whales were taken, one of these even being a yearling.

The catch of the San Francisco fleet was 20 in 1906, and 82 in 1907, but the success of the past year is the direct outcome of failure the year before, and the number of Bowheads taken this year will undoubtedly be small.

Nothing can possibly prevent the extermination of the Bowhead but the discovery of some perfect substitute for whalebone, and there seems not the slightest probability that this will be done, so that this huge creature will be one of the many victims immolated on the altar of fashion. Meanwhile it is worth noting that there is not a specimen of this whale in the United States and very few in the world and

¶According to Wieland the number of Bowheads taken by the Dutch between 1669 and 1758 was 57,590.

that some of the money being spent in futile endeavors to reach the North Pole might much better be devoted to chartering a whaler and securing one or two examples of the Bowhead before it is too late.

The Right whale was the first to be commercially exterminated, that is so reduced in numbers that its pursuit was no longer profitable, because it frequented the shores of temperate regions and there brought forth its young. It required but few years to wipe out the California Gray Whale as it was confined to a comparatively small area and the decimation of the others is but a matter of time.

The great Bowhead as we have just seen, is on the verge of actual, not merely commercial, extermination and is liable to be blotted out of existence at any time and other species will follow unless something is done to preserve them.

For many years certain species of whales, notably the Sulphur-bottom, enjoyed more or less immunity from pursuit, due to the difficulty of taking them by methods then in vogue and the small profit yielded when they were taken. But when the present appliances for taking whales were perfected the death knell of these whales was sounded and unless some measures are taken to protect them, they, too, will suffer the fate of the Bowhead.

Whaling stations are being established the world over wherever the conditions are favorable; there are several on the Pacific coast, several on the coast of Patagonia, and while in

deference to the fishermen, restrictions have been placed on the Norwegian whale fisheries, other stations have been opened in Iceland and the Færoes. There is some whaling from New Zealand and South Africa, and concessions have been granted for other parts of the world. This does not include whaling for Sperm whales and Humpback carried on from various Atlantic and South American ports. Moreover the rapid decline of the Newfoundland whale fishery has led some of the companies to send their steamers south in winter, accompanied by a large steamer fitted out for cutting in whales and trying out the oil, thus acting as a floating whaling station that may be moved from place to place as occasion requires or favorable conditions offer.

We speak of the *decline* of the whaling industry when it is really the *passing* of the whale, for there can be no industry in the proper sense of the word when there is no planting, only reaping, no attempt to provide for the harvest to be gathered.

Whales can be protected and protected very easily but it can only be done by international agreement. When we are far enough advanced, many industries like whaling and sealing, now on the verge of extermination, may be pursued for all time. This may be very difficult to bring about, but may be accomplished in time. The pity of it is, from a purely practical standpoint, that animals which can so readily be preserved, should be swept out of existence.

ZOOLOGICAL SOCIETY BULLETIN

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Zoological Society

October, 1908



NORTH FACADE AND DOME OF THE ELEPHANT HOUSE.



OF the building operations in the Zoological Park, the most important single feature is the "new" Elephant House.* Of ten years of building work, it is the climax; and it is fittingly crowned with a dome. It is situated on the site prepared for it by Nature, and chosen twelve years ago, on the axis of Baird Court, and in the open space midway between the Court and the Wolf Dens. In effect, it connects the two great groups of installations of the northern and southern regions of the Park, which until now have been slightly separated.

In several important particulars the Elephant House is unlike all other buildings in the Park. It is high; it is entered at the center of each side, instead of at each end; it is built entirely of stone; it has a main roof of green tiles, and has a lofty dome covered with glazed tiles laid in an elaborate color pattern of browns and greens. The dome is finally surmounted by a "lantern" of elaborate tile work, also in colors. Excepting the dome, the whole exterior structure is of smoothly dressed Indiana limestone. Each

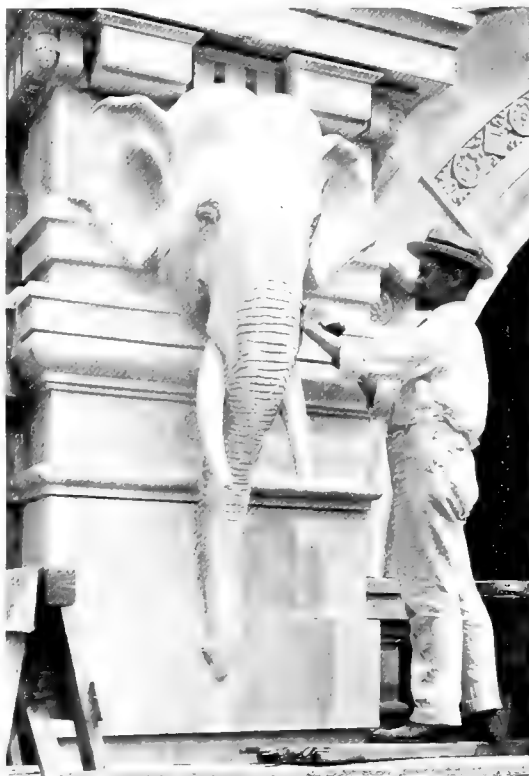
* We have been calling it "new," because previous to its completion, the thousands of visitors who inquired for "the Elephant House" were directed to the Antelope House, where the elephants were temporarily quartered.

entrance consists of a lofty and dignified archway, in which the doors are deeply recessed; and each of these arches is grandly ornamented by animal heads, sculptured in stone. The lines of the exterior of the building are imposing.

The color effects of the interior are particularly pleasing. The large, flat bricks of the Gustavino arch system are in their natural colors, and form a blending of soft brown and buff shades that not only avoids monotony, but is pleasing and restful to the eye. Combined with the vaulted

ceilings of the main halls and the cages there are a few strong arches of mottled buff brick which harmonize perfectly with the ceiling tiles of the main dome. This scheme of vaulted ceilings is so new that few persons ever have seen a finished example. Both the main dome, and the arched ceiling below it, have been constructed by Gustavino without the employment of either the steel rafters or ribs which one naturally expects to see in such structures.

The animal sculptures on the Elephant House are of commanding interest and importance, and well worthy of the stately building that they adorn. In the sculptor's competition which was held last year, the work of Messrs. A. P. Proctor and



HEAD OF INDIAN ELEPHANT, SOUTH FACADE.
The Sculptor, A. Phimister Proctor, at Work.



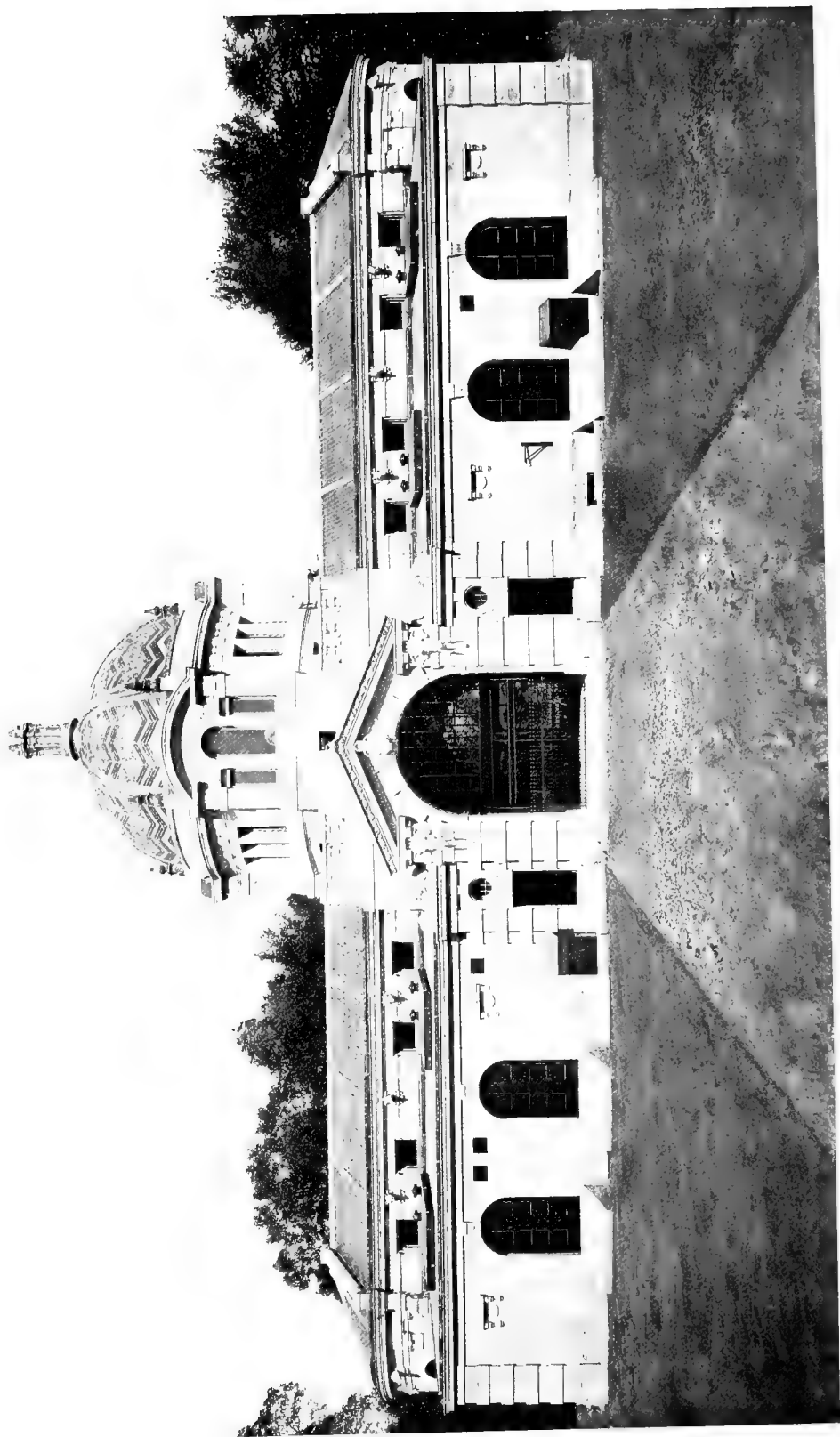
INDIAN ELEPHANT "GUNDA" IN HIS NEW QUARTERS AT THE ELEPHANT HOUSE.

Charles R. Knight was so nearly equal in merit that it was impossible to choose between them, and for this reason the work was divided, one-half of it being awarded to each. Mr. Proctor has executed for the south entrance, two large heads of the Indian elephant and an Indian rhinoceros, while Mr. Knight has modeled the three heads of African elephant and African rhinoceros that ornament the north entrance. All these are fine examples of wild-animal sculpture, and well illustrate the extent to which the realism of Nature may be fitly applied to a modern building, in place of the grotesque and conventionalized sculptures that hitherto have enjoyed the favor of architects. I think it is safe to say, in America at least, that the day of grotesque "architectural" animal sculpture has passed.

The cornice, or frieze, of the main central building of the Elephant House is ornamented by about twenty sculptured heads of the rhinoceros, tapir and hippopotamus. In the interior of the building, each column in the lines of cage-

fronts bears a small elephant head, in high relief, sculptured in stone.

Each of the eight immense cages, that are to contain elephants and rhinoceroses, has been designed to frame and display its living occupant as perfectly as a frame fits a picture. The vaulted ceilings and large central skylights are particularly well adapted to cages for extra-large animals, and the lighting is quite perfect. The front of each cage—24 feet—is spanned aloft by a single Gustavino arch, and is unspoiled by intermediate columns. Each cage is 24 x 24 feet, which is ample for elephants and rhinoceroses of the largest size. To a height of 6 feet the walls are lined with plates of quarter-inch steel; and nothing less powerful than a locomotive could break through or break down the front bars and beams. The outside doors are marvels of strength and smoothness in action. They are of four-inch oak, reinforced with quarter-inch steel plates, and on the inside they are strengthened against attack by three heavy movable beams of steel.



SIDE ELEVATION OF THE ELEPHANT HOUSE.

View taken from the south. The yards will occupy the open space to the right and left in front of the building.



AFRICAN TWO-HORNED RHINOCEROS, "VICTORIA."

The Zoological Society has two animals of this species, a male and a female.

On the south side of the building are four cages for elephants, on the north are two cages for rhinoceroses, and two for hippopotami. At each end of the building are two smaller cages for tapirs or young elephants or rhinoceroses. The hippopotamus cage is provided with a bathing tank, and so are two of the tapir cages. As usual, this building is heated by hot water, and thoroughly ventilated.

Of course each indoor cage has for its occupant a spacious open-air yard, in which the animal may wander at will without the ability to harm any person or thing. For the elephant yards there are two fences. The extra heavy inside fence of steel bars is to prevent the elephants from reaching visitors, and the outside fence, of $\frac{3}{8}$ -inch round bars seven feet high, is to prevent visitors from reaching the elephants. The yards and fences cannot be completed earlier than May, 1909, but they will be ready upon the coming of warm weather. In several of the yards some very elaborate and extensive concrete floor work will be necessary to preserve valuable oak trees from the injury that would surely follow the laying of ordinary macadam

paving. The concrete floors are to be raised, to leave the roots of certain trees almost untouched.

The total cost of the Elephant House was \$157,473 exclusive of the fences, yards and walks. The building has been erected by the F. T. Nesbit Company, with Mr. John C. Coffey as superintendent of construction, and it is a fine, perfect and thoroughly satisfactory piece of work. It is doubtful if the City of New York has ever before secured so fine and large a building as this for the really small sum that this one has cost. It is impossible to name the date on which it will be received by the Society, occupied, and opened to the public, but in all probability it will be about November 1, 1908.

W. T. H.

New Mammals:—Since July 1, the following important animals have been received:

- | | |
|---------------------|----------------------|
| 1 Indian Elephant. | 2 Otters. |
| 1 Chimpanzee. | 1 Cacomistle. |
| 1 Orang utan. | 1 Brown Lemur. |
| 1 Malay Tapir. | 3 European Roe Deer. |
| 3 Clouded Leopards. | 14 Squirrels. |



FEMALE INDIAN ELEPHANT "LUNA."

A SCARED ELEPHANT.

ON September 10th the Society purchased at Luna Park, Coney Island, a female Indian elephant that is about twelve years of age, seven feet, seven inches in height, and weighs 4,500 pounds. On September 18th, when that animal became both panic-stricken and contrary-minded, she furnished the most exciting episode that has yet occurred in the Zoological Park. The members of the Zoological Society will no doubt be interested in knowing the real facts in this rather remarkable case.

The causes of "Luna's" mental disturbance lay in the fact that naturally she is of a timid disposition, and was suddenly and without warning taken from her old haunts, from her three companions, and from her favorite keeper at Luna Park, to entirely new surroundings, and strange keepers.

For nearly a week she endured the change quite bravely, but at last her nerves gave way before a trifling cause. She was frightened by the sight of the pumas in their cage near the Small-Mammal House, wheeled about, and started to find a safe retreat. The open door of the Reptile House looked inviting, and she

headed for it, taking her two keepers along with her. Of course Keepers Thuman and Bayreuther did their utmost to restrain her, but she paid no attention to their hooks, and deliberately walked into the building. Evidently she thought it was a barn, and possibly she hoped to find within it the three companions she had left in the big and gloomy elephant-barn at Coney Island.

The Reptile House contained about fifty visitors, and naturally the sight of the huge animal walking around the eastern end of the turtle-crawl, created consternation. One woman fainted from fright, and was promptly carried into Mr. Ditmars' office, placed in a chair and revived. Another woman fell while attempting to run away, and cut her forehead against a guard-rail. In a very few minutes the elephant was led out of the building, without having occasioned any damage to it, or to any person; but when she reached the open air she again became panic-stricken. Then, to the amazement of everyone who saw her, she squeezed through the south door of the Tortoise House, and was there found by the Director, trembling with nervousness and fright.

Attempts were made to calm her with food, but she was too excited to eat. In about fifteen minutes she became dissatisfied with the company of the giant tortoises, and squeezed out into the open air. Strong efforts were made to lead or drive her southward toward her home in the Antelope House, and in due process she was started on three different walks leading in that direction. Each time after a hundred feet had been covered her hysteria returned, and she resolutely wheeled from the course. Twice she attempted to re-enter the Reptile House and was prevented, but the third time she made good her second entrance, dragging her keepers with her.

Once more she was halted in the main hall, turned and led out. During the next half hour Keepers Thuman and Bayreuther sought to coax or compel her to go southward to the Antelope House; and first and last, she was tried on five different walks and roads. Finally she made a determined break for the Reptile House, and in spite of all opposition, went in a third time.

By that time Keeper Thuman was well nigh exhausted, and it was plain that an end of some kind must be reached immediately. The Director at once ordered that "Luna" be chained for the night in the main hall of the Reptile House, fronting the doorway; and in quick time this was accomplished. From her shackled front feet two long chains were run out right and left, and firmly secured to the bases of two guard-rail posts. In that position she was held all night, and remained quiet and well-behaved until morning.

It was hoped that the quiet hours spent in the Reptile House would calm "Luna's" nerves, and that in the early morning she would consent to return to her stall. But the workings of her mind were past finding out, and it was decided to keep her front feet well shackled together. No sooner was one of her anchor chains loosened than the most exciting incident of this episode occurred.

"Luna" swung over to the limit of her remaining chain, within reach of the small table cases of lizards ranged along the south side of the main hall, and deliberately began to wreck them. She pushed off three of the cases, then overturned the table and wrecked four more. While Keeper Thuman was frantically endeavoring to control her, she deliberately set both front feet upon the guard-rail, and broke down a section of it.

By a great effort, "Luna" was then driven out of the building, and in less than fifteen minutes thereafter her front feet were anchored to a tree, her hind legs were closely tied together,

she was thrown, "hog-tied" and securely anchored, fore and aft. She struggled long and valiantly, but after a time gave up. Straw was brought and put under her head, and she was left to think matters over. During the day, the Saturday crowds of visitors inspected her briefly and with mild interest, then went their way to see other animals.

At three o'clock "Luna's" favorite keeper, Richard Richards, arrived from Luna Park, and the elephant immediately recognized him. At the Park's closing hour, one of the young African elephants was brought from the Antelope House, to be used as a guide for "Luna" on the journey back to her quarters in the Antelope House. Her leg bonds were transformed into ordinary hobbles, and she was permitted to rise. With her own keeper at her head, she quietly followed "Kartoom" to the Antelope House, entered her stall, and the incident was closed.

In a very few hours, "Luna" again settled down into a quiet, well-behaved beast. On the following day Keeper Thuman made her lie down, rise, and place him upon her back.

Keeper Thuman displayed great courage and persistence in his long struggle with "Luna," and once he narrowly escaped being injured, by accident. It is a satisfaction to be able to report that from first to last the elephant manifested no ill-temper toward anyone; and but for her spiteful breakages in the Reptile House, all of which were quite unnecessary, we could easily forgive both her panic and her stubbornness.

W. T. H.

A LARGE SEA TURTLE.

ON September 7th, the Aquarium received another specimen of the great harp turtle or leather-back, (*Dermochelys coriacea*), weighing 840 pounds, nearly 100 pounds more than the one received in June.

This we believe to be the largest specimen of a sea turtle on exhibition anywhere, at least we do not know of an example in any American or European Museum which exceeds it in size. It is not likely that any species of sea turtle exceeds 1,000 pounds in weight. The Aquarium gets one or more harp turtles every summer. They generally die during shipment, or within a few days after arrival, and are turned over to the Museum. When captured along the coast, fishermen report them as weighing from 1,000 to 1,500 pounds, but on the scales they shrink to 700 or 800. Although the harp turtle does not feed in captivity, the present specimen has broken the Aquarium record by living two weeks. But its keeper is not hopeful.

C. H. T.

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Elwin R. Sanborn, Asst. Editor

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THE RUBBISH WAR.

During the past three years, the rubbish wilfully and inexcusably thrown upon the walks and lawns of the Zoological Park had become more and more irritating to the nerves of those responsible for cleanliness and good order. During that period, however, we were so busy with the annual rush of construction work that we had no time in which to make a determined campaign against it.

Last spring, however, the auspicious period arrived, and the war that so long had been intended was formally declared. To-day we are prepared to write the first chapter of its history.

The making of wholesale arrests in the Zoological Park, and the haling of a large number of pleasure-seekers before the night court, was painful to contemplate, and would have been still more painful to carry into effect. We decided to avoid those measures, as far as might be possible, by a preliminary campaign of education. To this end we carried out the following program:

In 1907, we finished the placing of about 100 well-appointed rubbish baskets. If the whole truth must be told, the "Bronx Park Basket," an imitation tree-stump in metal, with a movable basket inside, was invented by the Director, with special reference to its use in public parks.

Over each basket was placed a sign, saying "Deposit Here All Refuse." Many other signs had been posted, previous to 1907, forbidding the throwing of rubbish on the walks.

On May 25th, 150 special cloth signs, printed in English, Yiddish, Italian and German, forbidding the scattering of rubbish, and directing that it be placed in the baskets, under pain of punishment for neglect, were posted so conspicuously that it was impossible for a visitor to enter the Park without seeing at least one.

On May 29th, a manifesto by the Director appeared in several of the newspapers of New York City, formally declaring war on the rubbish-throwing habit, and warning all possible offenders to obey the law of the City, or suffer arrest and punishment. For the publication of our communication, and editorial articles thereon, we are indebted to the following newspapers:

| | |
|--------------------------|-------------------------|
| The Times, | Public Opinion, |
| The Tribune, | Morning Telegraph, |
| Staats Zeitung, | Vogue, |
| North Side News, | The Independent, |
| Bronx Sentinel, | Columbia (S. C.) States |
| The Herald, | Colorado Springs |
| Standard-Union, | Gazette, |
| Jewish Daily News, | Providence (R. I.) |
| Jewish Morning Journal, | Tribune, |
| L'Araldo Italiani, | Plainfield (N. J.) |
| Courrier des Etats-Unis, | Courier. |

The support received from the *Tribune* and *Times* was exceedingly valuable and helpful, and is most gratefully acknowledged.

On Sunday, May 30th, hostilities began in the Park. Ten men of our force were specially detailed to do patrol duty, and instructed to admonish all throwers of rubbish, and compel them instantly to pick up whatever they threw down. It was ordered that the campaign for the education of the public should be carried on without making arrests, *so long as substantial progress was perceptible*. At the same time, however, officers were in readiness to act, and had the law been resisted, arrests would have swiftly followed. The Commissioner of Police granted us two extra policemen, and Captain George C. Liebers, of the 68th Precinct, entered heartily into the campaign with all the extra men that he could spare. The Society and the general public are greatly indebted to Mr. Hermann W. Merkel, an officer of the Park staff, and also a special police officer, for the vigor with which

he entered into this campaign, and the splendid success of his labors. It would be impossible to say too much in praise of his continuous efforts to preserve order in the Park, and to render every portion of our grounds thoroughly safe for women and children.

The results were immediate and very gratifying. Within a month the amount of waste paper, fruit skins and lunch boxes thrown upon the walks and lawns, and under benches, diminished about seventy-five per cent. Within two months the decrease amounted to *about ninety-five per cent.* of the original total; *and all this without the making of even one arrest!* It was found necessary, however, to prohibit absolutely all persons from sitting or lying upon the grass, for the reason that it was found quite impossible to prevent such persons from leaving rubbish behind them. Owing to the presence of 300 park benches within our grounds, it is not at all necessary for anyone to lounge upon the grass.

Last year, on every Monday morning the Park was a disgraceful sight, and it required the labor of ten men until about two o'clock in the afternoon to gather up the rubbish. Now, by ten o'clock on Monday mornings, four men make the Park thoroughly clean and presentable. What is still more important, the Park is *clean during nearly the whole of Sunday*, instead of becoming by noon of that day a distressing scene of disorder under foot.

An important lesson has been learned. It has been clearly observed by many persons, that the disorderly period attracted disorderly crowds! When the reform was fully established, the disorderly element seemed to withdraw, and go elsewhere, and there followed *a great influx of visitors of a better class, who believe in law and order, and prefer to go only where they can enjoy cleanliness!*

Our warfare has received from the best element in New York, constant encouragement. We have on file many letters commending our efforts, and wishing us success. Beyond question, *the people of this city pay for, and are entitled to, clean streets and clean parks!* Those who disgrace New York by strewing rubbish broadcast, in spite of warnings, should be sternly dealt with. Our streets still are garnished, in the gutters, with waste paper; and the bad habit that leads to it should be taken in hand by the Police Department, and broken up. The first step should be the posting of about 5,000 warnings, printed on linen, as an educational effort. The laws on the subject are ample. The unhindered throwing of rubbish in streets and in parks promotes a spirit of lawlessness

and disorder that easily leads to more serious offenses. In view of all that this city is spending and doing for the comfort and pleasure of the people, the lawless ten per cent. should be forced to obey the laws of decency and good order.

W. T. H.

TWO SUBSCRIPTIONS.

In the last issue of the BULLETIN, subscriptions amounting to \$3,510 for the special animal fund were acknowledged. It now affords us much pleasure to report the receipt of a subscription of \$500 from Mr. Nelson Robinson, which brings the total up to \$4,010, and quite fulfils the expectations under which a fund of \$4,000 was asked for.

We also gratefully acknowledge a special subscription of \$250 from Mrs. Frank K. Sturgis, to be devoted to the experiments of Mr. C. William Beebe, Curator of Birds, in the practical determination of the influences affecting the colors of birds. It will be remembered that Mr. Beebe's paper on "Geographic Variations in Birds with Especial Reference to the Effects of Humidity" was published by the Society as Vol. I, Number 1, of "Zoologica," and among ornithologists generally it created a profound sensation.

MISNAMING OF THE ZOOLOGICAL PARK.

Thanks to the persistent efforts of a few men in this city, the New York Zoological Park is now called by the newspapers of the United States generally "Bronx Zoo," "Bronz Zoo," "Bronx Park Zoo," and other combinations equally offensive. We cannot felicitate our friends on having made the corrupted name of an ancient Dutchman greater than that of the city that has given the people of this whole nation a first rank zoological park. It is extremely desirable that the Zoological Park should be called by its right name, and we invite all of the many friends and admirers of the Park to cooperate with us in suppressing the extremely inappropriate and ill-sounding names cited above. Our citizens should all be proud that the name "Zoo" is inappropriate, if only because the Park is planned on a scale which so far exceeds that of any other civic collection in the world.

The attendance at the Aquarium has already passed the two million mark. This year will far exceed any previous year in this respect. Labor Day brought over 21,000 visitors.



MALE SOUTH AMERICAN CONDOR.

NEW WORLD VULTURES.

By C. WILLIAM BEEBE,
CURATOR OF BIRDS.

Part I.

THE very name of vulture has come to express unpleasant things and to symbolize evil ways and characteristics. Few people associate these birds otherwise than with surroundings of ill-smelling carrion, but this is most unfair, both to birds in a wild state and to those in captivity. Although it would perhaps be difficult to frame an encomium on all their ways of life, yet vultures are interesting birds and if given opportunity, prove to be as clean feeders as their more noble brethren—the eagles and hawks. If given a choice between two pieces of meat, one fresh and the other spoiled, a vulture will invariably choose the former.

Vultures occupy a unique position in the economy of nature. Although strictly carnivorous in diet, they are unable to kill prey for themselves. They have the strong, hooked beak of other raptors, but their toes and claws lack the strong muscles that give to eagles such formidable means of attack. Thus the vultures live Tantalus-like, ever in sight of abundant food and yet unable to satisfy themselves except by the accidental death of some creature.

To cope successfully with these hard condi-

tions, vultures have acquired certain peculiar characteristics. Their prey falls to them in often large quantities but at very irregular intervals, and they are able to take advantage of a time of plenty and gorge themselves to repletion, devouring a surprisingly large amount of food. On the other hand, they possess remarkable powers of fasting, and can retain their strength during a period of five or six weeks abstinence from food.

The third characteristic of vultures relating to their predatory handicap is their wonderful eye-sight. There is little doubt that this surpasses even that of the hawks and eagles, and probably represents the highest development of the power of vision of any living creature. It has been proved conclusively that they find their food by the sense of sight alone, and indeed apparently lack the sense of smell.

During a trip to a wild part of Mexico I once noted an incident which illustrates this unusual vision, and gives a hint of the extreme competition for food which vultures must ever endure.

At the edge of a stream, I once undertook to prepare an armadillo for the pot. His tough skin made it a rather difficult and engrossing task, and for some twenty minutes I did not look up from my work. While on my way to the water I had thoughtlessly noticed a single black speck high up overhead, so usual a sight



SOUTH AMERICAN CONDOR.
Head of male bird.

that I hardly remembered it. When at last I arose from my completed work and stretched my cramped limbs, every dead tree and boulder within a wide area held its complement of vultures—black and turkey. It was most uncanny. Their skinny necks were stretched out toward me; many score of red and ebony heads peered through leaves and over rocks and dead limbs, forming a ring of watchful, silent spectators. Overhead the sky was quartered in every direction by dozens of others. Within a few minutes all these birds had come, each guided by the suggestive descent of some brother vulture, who in turn had well interpreted *his* neighbor's actions. All were waiting patiently for the expected feast. And what a feast! It was the "loaves and fishes" over again without any chance for a miracle. Nearly two hundred birds as large as small turkeys were eagerly waiting for the moment when I should leave to them the remains of one small armadillo!

The collection of New World vultures in the New York Zoological Park is at present complete—that is to say, all five genera of this group are represented by living specimens. The vultures of the Old World are very hawk-like, so much so that they are placed in the same order with those birds of prey. But the vultures of our own hemisphere are sufficiently distinct from all other groups to deserve an order of their own, CATHARTIDIFORMES. Perhaps the most marked difference is the absence of a voice in the vultures of the Americas, due to the absence of a syrinx—the avian vocal organ. The Old World birds can scream and voice their emotions in sound, but our vultures

must live ever silent, or utter only the hiss of escaping breath. The single family *Cathartidae* includes the following genera:

- I. South American Condor (*Sarcorhamphus gryphus*).
- II. King Vulture (*Gypagus papa*).
- III. Black Vulture (*Catharistes urubu*).
- IV. Turkey Vulture (*Cathartes aura*).
- V. California Condor (*Pseudogryphus californianus*).

The completeness of our collection, together with the interest which these little appreciated birds present, has led to the making of a résumé of their habits as far as these are known.

THE SOUTH AMERICAN CONDOR.

A pair of these splendid birds was received at the Zoological Park November 30th, 1899. The female died shortly afterward, but the male is still in perfect health, after nine years of life in New York City. This species has been known to live thirty-three years in captivity. Our bird has been a constant source of attraction to visitors and, peacock-like, enjoys showing himself off to admiring throngs. He has lived outdoors summer and winter, apparently as comfortable in the coldest blizzard as in the hottest summer weather. His chief trait, characteristic indeed of all the larger species of vultures, is a curious spirit of play, exhibited in antics about his keeper or manifested toward other birds in the big flying cage. Formerly his summers were spent in this huge enclosure, where he never made any attempt to injure other birds or even to feed upon the body of any one accidentally killed. At last, however, his play became too rough. He would seize a flamingo by one wing and dance around and around, pulling the terrified bird about, and sometimes throwing it down. For the last few



KING VULTURE.
Head of the male bird.

years, the Condor has been kept in his winter cage throughout the year. At midnight on a snowy winter's night I have watched this bird play by himself for a half hour in the moonlight; dancing on the snow, throwing about one of his own giant quills and chasing his shadow; a strange performance explained in no natural history, and one which seems all the more remarkable when we think of this great vulture as the accepted type of a slothful gourmand.

The Condor in the Park is remarkably strong and when it becomes necessary to transfer him, three men are required to hold the great bird fast in a wolf net. He refuses to touch carrion but will eat fresh meat and fish. Like all vultures, he has no grasping power in his feet and claws, and thus his method of feeding is to stand upon his prey, take a firm grip with his powerful hooked beak and pull strongly upward until a small piece of flesh is torn away.

Like other vultures, the flight of the Condor is magnificent, soaring for hours, often hundreds of feet above the highest snow-capped peaks of its native mountains, or swiftly descending thence to the distant speck which its marvellous vision marks out as food. In contrast to others of its family, the South American Condor seems to possess certain predatory instincts. Several individuals are said to band together at times and, rushing at some animal standing near a precipice, frighten it into stampeding to its death, when the birds descend to feed upon its body. This may be the result of the extremity of hunger driving the birds to take desperate measures to avoid starvation.

The Condor lays one or two large white eggs upon a narrow ledge of some inaccessible cliff. Sixty-two years ago an egg was laid and incubated in the Zoological Gardens of London—the only recorded instance of this species breeding in captivity. The chick hatched in fifty-four days but lived only six weeks. From observations of young Condors it seems probable that the nestling spends six or seven months in the nest before it is able to fly. The great wing quills of the Condor come into vogue now and then in the millinery trade, and many thousands of birds are slaughtered yearly to supply this shameful demand.

The courtship of the Condor begins about the first of the year, and extends throughout February. Lacking a mate of his own kind, the bird in our collection shows off to the female griffon vultures or bald eagles. He half raises his splendid wings, curving them around so that all the white markings are brought into view; then he struts back and forth before the object of his attentions. The head is brought forward



KING VULTURE, FEMALE.

and downward while the neck is strained upward in a pronounced curve, the colors of the skin showing brightly at this season. Successive hisses are uttered, the spasmodic exhalation of the breath vibrating throughout the whole bird. At last, with a final prolonged hiss, he sinks down upon his tarsus, closes his wings and the performance is over. Although his eyes are open during the display, he seems in a kind of trance, and takes no notice of what goes on around him.

The strange attitudes which this bird often assumes during sleep are as remarkable and characteristic as is his pronounced playfulness. When perching, his head and wings will sometimes hang straight down—the bird apparently dead and about to fall to the earth. Or again when a visitor perceives this great bird prone upon his back with feet in air, wings half open and beak agape, a hurry call is naturally sent to the keeper to remove the body of his defunct charge; but in a fraction of a second the Condor will spring upon his feet, as much alive as ever.

The word Condor is the Spanish equivalent of the native Peruvian *Cuntur*. It inhabits the Andes of Ecuador, Peru, Chili, and Patagonia north to the Rio Negro. The size of the Condor has been greatly exaggerated by writers. No less a personage than Alexander von Humboldt was led to believe that these birds sometimes had a spread of wing of fifteen feet. As a matter of fact, with the exception of the California Condor, the South American bird has the greatest expanse of wing of any American land bird, but the average spread of a full grown male is only nine to nine and one-half feet.

The male is distinguished by a large fleshy comb or caruncle which adorns the head. The bare head and neck are wrinkled and of a dull reddish or leaden color, while the glossy black plumage of the body is surmounted by a fluffy collar of softest, whitest down. The body plumage is entirely black, while the exposed portions of the wing feathers are white,—a striking pattern when the bird extends its wide pinions to the morning sun.

THE KING VULTURE.

As the Condor reigns supreme among the great peaks of the southern Andes, so the King Vulture dominates the lowland forest regions. Its range is therefore much more extensive—reaching Paraguay in the south, becoming most abundant in Brazil and showing its splendid form high in air as far north as Mexico. By preference it haunts the wooded banks of rivers and the depths of impenetrable swamps, but from its lofty, aerial outlook it commands many square miles of varied territory, and will be found wherever a promise of a feast comes within its keen range of vision.

The name of "King" is given it because of a wide-spread belief among the native Indians that all other vultures stand in awe of it, and that they invariably remain in the background until the royal appetite is appeased. When wild its food is chiefly carrion—but not apparently from choice, since in captivity it seems to prefer fresh meat.

Although not uncommon in some parts of its range, little has been recorded concerning the life history of the King Vulture. Two white eggs are laid, and the nest is said to be occasionally placed in the hollow of a dead tree.

During the first two or three years of life the colors are dark and obscure, but when fully adult the King Vulture is gorgeous. The head and neck are variegated with bare patches of red and yellow, while prominent folds and wrinkles of skin extend around the crown and down the neck. A bright yellow caruncle decorates the base of the beak and the iris is of a conspicuous white hue. A collar of gray is succeeded by a delicate cream color, and the rest of the body plumage is black and white.

A pair of King Vultures was purchased in June, 1905, and lived in the Zoological Park until a year ago when the male bird died. The female is at present in full color and plumage, and in perfect health. These two birds afford an excellent illustration of that individuality which is so strongly marked a character of most members of this great class of living beings. From first to last the male was wild, shy and nervous, showing no desire to make friends with

his keeper, and resenting every attempt at familiarity. The female bird became tame after a week and ever since has been noted for her quiet ways and confidence in her keeper. She courts attention and is never so contented as when being played with and petted. Two creatures more unlike in temperament could not be imagined.

When, in the tropics, one watches the ever present lesser vultures wheeling and floating like black motes high against the sky, it always brings a thrill of delight when one sees the sun flash out from the white feathers which indicate that the King Vulture is abroad.

(To be continued.)

THE BISON SOCIETY FUND.

THE United States Government has formally selected as the range for the Montana National Bison Herd the site that was recommended by the American Bison Society. It consists of twenty square miles of fine grazing grounds at Ravalli, Montana, with a frontage of seven miles on the Jocko River. The land will cost the government about \$30,000, and the fencing will cost \$10,000 more. Both these sums have been provided by a Congressional appropriation, and in a few months the range will be ready for occupancy.

For three months the President of the Bison Society has been calling for subscriptions of money with which to buy the nucleus herd that the Society is pledged to present to the nation as soon as the range is ready. Despite the difficulties of a canvass in midsummer, the total fund now in hand amounts to \$3,050. This is a very fair beginning,—but it leaves \$7,000 yet to be raised! Every state has been appealed to for contributions, chiefly through the Mayors and Boards of Trade of the cities having a population of 30,000 or above. Thus far *not one dollar* has been received from or through any one of the 148 mayors who have been called upon for cooperation! Whether the Boards of Trade will do any better, remains to be seen; for this canvass will at least be illuminating.

It was the business interests of this country, represented by men who desired robes to sell at \$2.50 each, that exterminated the bison millions thirty years ago. To-day it is the plain duty of business men of America to lend a hand in the effort that is to leave for future generations of Americans something more than bleaching bones, and records of shameful slaughter.

Members of the Zoological Society are now invited, and also urged, to participate in this work by sending subscriptions, in sums of all

sizes from \$1 upward, to W. T. Hornaday, New York Zoological Park. It is urgently desired that the whole amount should be in hand by January 1, 1909. Surely the object is one in which all the members of our Society will be interested. *A dollar from each member would mean \$1,600!*

Please send it now.

W. T. H.

HEADS AND HORNS ANNUAL.

THE quarto annual publication of the National Collection of Heads and Horns, (Part II), is now in hand. Its special purposes are to acknowledge in detail the gift of the past year, and to further interest sportsmen and travellers in the National Collection that now is being formed here. Its special feature is a description of the famous Reed Collection that was presented to the Society a year ago by Mr. Emerson McMillin. This publication will be mailed to all members of the Zoological Society who may desire to possess it, and who will send their names to Mr. Madison Grant, Secretary, 11 Wall Street.

THE AQUARIUM RESERVOIR.

FOR the first time in the history of the Aquarium the sea fishes and other marine exhibits have had a chance to live in their natural element. Under the old regime they could scarcely be said to live at all. In fact the majority of them didn't live; they died. It was only by constant replacing that many of the salt water species of fishes could be kept on exhibition. The brackish and unclean water of the harbor—by courtesy called salt water—was never suitable for sea fishes and invertebrates, and only the most hardy survived. Whatever the Aquarium has done in the past, has been accomplished under this fearful handicap.

For three months pure sea water, brought from the open sea and stored in the new reservoir, has been flowing through the tanks. The expensive, troublesome and disheartening death rate has been practically eliminated. Our specimens are active, feed well and look well. Their colors are decidedly brighter than usual. The only losses which now occur are those traceable to injuries received during capture and shipment, while an important number of forms, never successfully exhibited here before, are not only living but apparently thriving.

The system of stored sea water now makes possible at the New York Aquarium anything in the way of marine exhibits that is possible in the aquariums of Europe. For the first time many beautiful sea creatures, hitherto lacking from our collection, are now on exhibition.

Although a good collection of marine invertebrates has not yet been secured, there are a few very interesting species already in the tanks, among which may be mentioned the octopus, the great salt water crayfish, and the so-called Spanish lobster, (*Scyllarus*), from the Bermudas.

Upon the completion of the stored sea water system early in July, the reservoir was filled with 100,000 gallons of pure sea water. For this purpose the water boat "Joseph Moran," of about 15,000 gallons capacity, was chartered. This vessel filled her tanks in the open sea near the Sandy Hook Lightship at the beginning of the flood tide. Returning to the sea wall behind the Aquarium, the water was pumped directly into the new filters, whence it flowed to the reservoir. The harbor water being allowed to flow out of the exhibition tanks, the Aquarium's new bronze pump was started, and the sea fishes were soon swimming in their natural element. The accompanying picture shows the "Moran" behind the Aquarium, pumping her cargo of water into the reservoir. Another picture shows the location of this reservoir in Battery Park, its extent being indicated by the dotted lines.

While the system of stored sea water is a new thing for our Aquarium, it has always been used in the Aquariums of Europe. When properly managed, the water does not need renewal, the original supply being used perpetually.

While the cost of this system amounted to a considerable sum, it is expected to prove economical in the end, as it will result in a great saving of coal during the winter months. Formerly the water, artificially warmed during the winter, was allowed to escape, whereas, under the present method it passes through the filters back to the reservoir. The great amount of steam formerly required to heat the icy water of the harbor will no longer be required. It should require but little steam to maintain an even temperature in the underground reservoir.

The large floor pools at the Aquarium, owing to the low position in which they are placed, are not connected with the reservoir but are still being supplied from the harbor. Owing to the polluted condition of the water of the harbor, it will be necessary before long to discontinue its use entirely, and arrangements will have to be made for a better water system for the floor pools. As these pools are occupied chiefly, at present, by lung-breathing animals such as seals and sea turtles, the water is not so deadly in its effects as it would be to strictly ocean fishes. The few fishes remaining in the pools are brackish-water species which have more endurance in impure water.



THE WATER BOAT "JOSEPH MORAN."

The new water supply in the reservoir has nearly *twice* the salinity of the harbor water and none of its impurities.

The salinity of the open ocean varies only between the limits 1.023 and 1.028, according to location, temperature, evaporation, etc.

In enclosed seas like the Caribbean, Mediterranean and Red Sea it is highest, the salinity being often 1.027 or 1.028. In the Black Sea the surface water is often quite fresh, the bottom water being dense like that of the Mediterranean.

In New York Harbor, at the Battery, our observations vary from 1.008 in winter, to 1.016 in summer when the Hudson is low. Fresh water is represented on the salinometer by 1.000, each unit in the third place, thousands of the density.

The sea water in our reservoir, brought from near Sandy Hook Lightship, has a salinity of 1.021. It would have been more salty if it had been procured farther off shore. C. H. T.

A VISITOR'S OPINION.

THERE are reasons why the letter printed below is of special interest to members of the Zoological Society. The life of a keeper of live animals in a public park is filled with worries and annoyances to an extent quite unknown to the public. Worse even than the perverse ways of the animals themselves are the annoyances to which attendants are almost constantly subjected by the few unruly visitors who wilfully annoy animals, or feed them on the sly.

It is no small achievement for a Zoological Park worker always to "look pleasant," and cheerfully answer his share of the countless inquiries made by visitors. Nevertheless, for nine years, politeness and courtesy to visitors in the Zoological Park have been insisted upon.

The following letter is by no means the only one of its kind that we have received. It was written by a man who is not a member of the Society, and who, so far as known, is an entire stranger to the members of the Zoological Park force.

W. T. H.

POSTAL TELEGRAPH-CABLE COMPANY.

Office of the Superintendent of Tariffs,
Postal Telegraph Building, 253 Broadway,
ISAAC SMITH,
Superintendent.

NEW YORK, August 17th, 1908.

MR. WILLIAM T. HORNADAY, Director,
Zoological Park,
New York City.

MY DEAR SIR:—

I visited the Bronx Zoo on Saturday, the 15th, and one thing that struck me was the absolute and uniform courtesy on the part of the employees at the Zoo. It was so refreshing to meet and have courteous treatment extended by each employee of the Zoo, spoken to, or of whom any information was asked, that I feel that it is a pleasure to bring the matter to your attention.

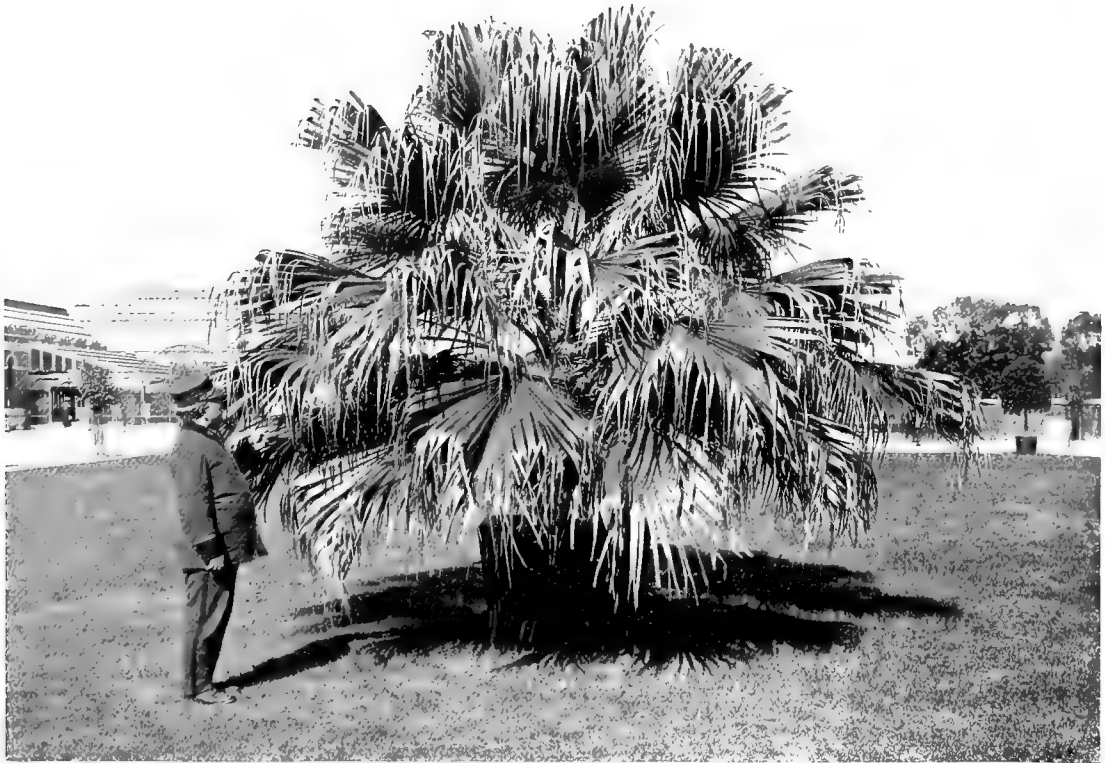
I spent about 4 hours at the Zoo, and after being treated so courteously myself, I made it a part of my business to observe whether other people received the same courteous treatment, and I am glad to say that all persons received the same courteous treatment that I did.

Respectfully, I. SMITH.



THE AQUARIUM RESERVOIR.

The dotted lines mark the boundaries of the reservoir. The structure in the center is the entrance to the valve room.

FAN PALM (*Livistonia sinensis*).

Presented by the estate of William Ziegler, through W. S. Champ.

Sale of Deer.—On September 1st, the Zoological Park issued a circular enumerating the deer of various species that were then overcrowding the ranges, and were offered for sale. With but one exception, all the animals offered were born here, and all were well worthy to represent the Park. Of the 21 species of deer in the Park collection, thirteen have bred. The circular is fully illustrated, and contains much information of interest. It will be sent on application to anyone who is interested in the breeding of deer. About one-half of the deer offered have already been sold.

Sambar Deer.—As one of the results of Director Hornaday's efforts to bring about the acclimatization of the Indian sambar deer, (*Cervus unicolor*), in the South, Dr. Ray V. Pierce, of Buffalo, purchased of the Society a male and three adult females, which have been shipped to St. Vincent Island, in the Gulf of Mexico, near Apalachicola, Florida, and set free. The entire island is owned by Dr. Pierce, and it is

believed that the sambar will do well there. Of course the experiment will be watched with keen interest. The sambar is a great producer of venison, a prolific breeder, and being of sanguine temperament, it seems well adapted to some of the southern forests.

Black Leopard.—Our black leopard is dead. It was given out by the usual secret disseminator of false information, that the animal perished under distressing circumstances, in deadly combat with her male cage-mate. The published accounts of the battle were interesting, and even thrilling, but not so illuminating as the autopsy. The very sudden and quiet death of the black leopard was a puzzle to the keepers until Dr. Blair's autopsy revealed a long, sausage-like piece of fresh meat in the animal's wind-pipe, which completely filled the air passage, and caused quick suffocation. Her cage-mate was entirely innocent. No "fight" occurred, and no "truthful ever" reported anything of the kind.

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NEW WORLD VULTURES.

By C. WILLIAM BEEBE,
CURATOR OF BIRDS.

Part II.

Photographs by Herman T. Bohman and William L. Finley.
By the permission of The Century Co., New York.

THE BLACK VULTURE.

THIS vulture has a wide range in South America, being found as far south as Argentina, and is probably absent only from Patagonia and the higher altitudes of the Andes. It is, however, rather a bird of the sea-coast, and is almost invariably found there in abundance, while in the interior it is outnumbered by the turkey vulture. It is not found in the West Indies, but throughout Central America and Mexico the Black Vulture is universally distributed, and breeds abundantly. In the United States it

is resident in the South Atlantic and Gulf States, breeding as far north as North Carolina and the lower Ohio Valley. It is only very rarely that this bird straggles as far north as New York.

The Black is the smallest of the American vultures, measuring only two feet in length, with a stretch of wing of about four and a half feet. The bare skin of the head and neck is black, as is the whole plumage, this dullness being relieved by the underside of the wings, which are silvery. This small size and the black color have led to its wide-spread name of Carrion Crow.



PARENTS OF "GENERAL" PERCHED NEAR THE NEST IN THE SAN BERNARDINO MOUNTAINS, SOUTHERN CALIFORNIA.

JAN 12



THE SINGLE EGG OF CALIFORNIA CONDOR.
Egg from which "General" was hatched.

To see the Black Vulture at its best—or worst—it is necessary to visit a tropical sea-port. An unwritten law protects these birds throughout their entire range, as the most ignorant Latin-American is well aware of their value and usefulness to mankind. In the north we are familiar with the constant warfare waged against garbage and refuse, especially in our cities. In the easy-going tropics, while such refuse becomes offensive much sooner than with us, human efforts at cleanliness are ably seconded by the vultures, who act the part of scavengers. They often line the house-tops, ever alert for any scrap which may catch the eye, and a stranger is sometimes astonished at having a half dozen of these great black birds swoop down at his very feet, to fight and hiss over some bit of meat.

Every Spanish village and settlement has its quota of *Zopilotes*, at night retiring to the neighboring forest or roosting by scores upon the bare branches of some large dead tree, and returning in early morning to house-top and street.

The nesting habits of the Black Vulture are of the simplest. Gregarious at all other seasons of the year, it even nests in small colonies, a dozen or twenty pairs often nesting in a circumscribed patch of underbrush. No nest is made, not even a hollow scratched, but the two large handsome eggs are deposited on the ground in a dense growth of yucca, or close to a log among thick scrub. The parents are very wary, and were it not that in time they wear a distinct winding road to and from the eggs, it would be almost impossible to find them. The nesting season in the United States is from March to May.

The eggs measure about two by three inches and are creamy white in color, spotted and blotched with varying shades of brown and lavender.

Both parents share the duties of incubation, which lasts for about a month. The young are clad in fluffy white down, which is gradually shed and replaced by the dark feathers of the adult.



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"GENERAL" ONE DAY OLD.

THE TURKEY VULTURE OR BUZZARD.

This bird is of unusual interest as being the only vulture which occurs more or less regularly in the vicinity of New York City. Many have been observed on Long Island, and in New Jersey individuals are found almost every year as far north as Plainfield and Sandy Hook. Indeed, the news has just been received that they are really abundant every summer at the Delaware Water Gap. At this place there is a herd of five or six hundred deer on "Buckwood," the estate of Mr. Worthington, and the vultures seem to find an abundance of food there, feeding either on the occasional dead bodies of deer or on other animal matter. As many as ten or a dozen may sometimes be seen in a single flock.

Westward, the Turkey Vulture ranges from the Ohio Valley to the Saskatchewan region and British Columbia. Southward, it extends as far as Mexico. In that country it is replaced by a smaller form which is given the value of a subspecies, *Cathartes aura aura*. The Falkland Island Turkey Vulture, *C. falklandicus*, living in Chili and Patagonia, has the skin of the head pink instead of red. The status of the Turkey Vultures of other parts of South America is still under discussion, but there are at least two small forms in the north-eastern part of the continent, one with a yellow head and the other with a pinkish one.

But it is the typical Turkey Buzzard, *Cathartes aura septentrionalis* (Wied.), with which we are concerned. It is among the most graceful of all flying birds, and is a constant feature in southern skies.

The head and upper part of the neck are bare, wrinkled and bright crimson in color. The bill is white, and the plumage dark brown or black, glossed with green above. In the immature bird the head is covered with a soft



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"GENERAL" WHEN EIGHTY-TWO DAYS OF AGE.

down of grayish-brown. The eggs and nesting habits resemble those of the black vulture, although this bird has been known to breed in a deserted hawk's nest high up in a tree.

The Turkey Buzzard is about two and a half feet in length, and has a spread of wing of about six feet. Although these measurements are considerably greater than those of the Black Vulture, yet the latter is heavier in the body. This explains why the Buzzard is the more graceful flier, soaring for hours without a perceptible movement of the wings, while the Black Vulture with its shorter wings and tail must flap frequently in order to

keep its headway and altitude.

The Turkey Buzzards play their full part as scavengers, although not so numerous in the cities of the coast as their blacker brethren.

The statement made in Part I of this article that vultures apparently lack the sense of smell was intended to apply only to the larger species. I have carefully tested the power of scent in the South American and Californian Condors, and the King Vulture, and if present at all it is very slight indeed. In the Black Vulture the sense is appreciable, but even here it appears to function but little, but it reaches a greater degree of development in the Turkey Buzzard.

One experiment will illustrate this. In the large flying cage in the Zoological Park a number of Turkey and Black Vultures are "permanent residents." Three boxes were placed on the ground some distance apart, and the birds fed for a few days in various parts of the cage. Then after several days of fasting, a piece of tainted meat was placed under the central box. Care was taken to go through the farce of placing something under each box so that no visual hints of the location of the meat was conveyed. The vultures were very hungry, yet they did not leave their perches and come to the ground, al-



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PARENT CONDOR AND "GENERAL."
The man is stroking the young bird.

though they had watched their keeper intently. He now re-entered and threw down one or two small bits of meat. Within a second or two, almost as the meat left the hand of the keeper, every vulture swooped to the ground and was hissing and struggling for a portion of the food. Twice the Black Vultures walked close about the meat box without appearing to notice the odor which was clearly perceptible, even to persons outside of the cage. A Turkey Vulture walked to leeward, instantly turned and made his way to the box, which he examined on all sides. He was soon joined by two others of the same species, and all three took up their stations close to the source of the odor. Soon two Black Vultures came up, apparently impelled more by imitation than by actual discovery of the smell. All five birds remained for a long time grouped close to the box, going to it now and then, and examining it carefully. Thus even in the Turkey Vulture the sense of smell is certainly not highly developed, and compared with the sense of sight is defective indeed.

These Buzzards, in certain parts of the South, have

gained notoriety for themselves by actually killing animals. Sheep have to be carefully watched, as the Buzzards will kill the new-born lambs by striking at the eyes. But this recently acquired habit appears to be of very rare occurrence, and should in no wise militate against the incalculably wide-spread value of these birds to mankind in the tropics.

The inception of a habit such as this is easy to explain. On the first days of its existence the new-born lamb lies prostrate and motionless, often for several hours at a time. The Buzzard, seeing it thus, naturally supposes it to be dead, and as these birds usually

consume the eyes of a dead animal before devouring the remainder of the body, they naturally attack these organs first in the young lamb.

If the Turkey Buzzard could be added to our fauna, its graceful soaring form would be a never-ending delight, and if farmers could be made to distinguish it from equally harmless "hen" hawks, or better still be taught to wage war only on the sharp-shinned and cooper hawk, the introduction of these birds might be accomplished.



CALIFORNIA CONDOR "GENERAL" IN THE ZOOLOGICAL PARK.

It is the intention of the writer soon to attempt this. A Turkey Buzzard escaped in June, 1906, from our Flying Cage and in the following April, after the winter had passed, it returned and soared about our Bird Valley for days. A dozen of these birds will be quartered in an open paddock, their wings clipped and dead stubs provided for them to perch upon. An abundance of food will be provided, and it is hoped that as the moult proceeds and they gradually re-acquire the power of flight, they will be content to remain, or at least return yearly to this land of plenty.

THE CALIFORNIAN
CONDOR.

When a species of bird becomes so rare that every individual is worthy of a detailed life history, then indeed its days of existence are numbered. Such is the splendid Condor of California, which once ranged the mountains of the Pacific from Washington to Mexico. When herds of sheep and cattle were corralled among the mountains, poison was used to protect them from the inroads of bears and pumas. The innocent suffered as well, and the Condors were rapidly killed off. Now they are restricted to a comparatively few miles of the coastal ranges in southern and Lower California.

The Californian Condor is one of the largest birds of flight living on the earth to-day. Its length is nearly four feet and the extent of wing averages nine, with an extreme record of eleven feet, four inches. With all this magnificent stretch of wing, the average weight is only twenty pounds, twenty-six being the maximum. The bare head and neck of the adult is bright orange and yellow, and the plumage in general is sooty black. Many of the lesser wing feathers are edged and tipped with gray or white, and the under wing-coverts are pure white.

There are naturally very few of these birds alive in captivity. The Washington Zoological



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PARENT CONDOR COMING TO THE NEST.

Park is fortunate enough to possess three. The New York Zoological Society has had two individuals. One was purchased March 14th, 1905, and lived until October 17th of the following year, when some despicable specimen of humanity threw a rubber band into the cage of the Condor. The band was swallowed and resulted in the death of the bird.

Condor number two* was obtained from Mr. Finley on October 6th, 1906, and is still in perfect health, not having as yet acquired the coloring of the adult, although the bird is two and a half years old. An account of the habits in captivity of "General," as this Condor has been named, has already been given in the Zoo-

logical Society Bulletin in Mr. Finley's own words.† We are here able to give a brief résumé of the facts in the life history of this very bird now living at the Zoological Park, up to the time of his capture.

As long ago as 1895 a pair of California Condors were known to be nesting somewhere in a maze of steep canyons among the mountains of southern California. But year after year they eluded all searchers, and not until March 10th, 1906, was the nest discovered. Several persons tramped about the nest, shouting and calling, but not until a pistol was fired in the air did the old bird leave her home.

A huge boulder protruded from the steep mountain-side, and against this leaned a stone slab some ten feet in height. Behind was a cave measuring two by six feet and open at both ends, and on the floor, which was carpeted with

The facts concerning the life history and the illustrations of this individual are given by permission of Mr. William L. Finley, who has already published them in "The Condor" and "The Century Magazine."

†ZOOLOGICAL SOCIETY BULLETIN No. 24, January, 1907, pages 318-320.

dead leaves, feathers and bits of bark, lay a single great pale bluish-white egg. Within the shell was slowly developing the embryo of *General*, who, seven months later, was destined to spread his wings and soar about the flying cage in our Zoological Park.

The next visit to the nest of the Condor was made by Mr. Finley on March 23rd, and most opportunely, as *General* had just hatched, and lay helpless, a pitiful little object, bald-headed, and scantily clad in white down. The head, neck and feet were pink, and the newly-hatched Condor weighed less than a pound. The mother would not leave her chick and made no resistance when it was lifted out to be photographed. A cold rain was falling, and the chick became chilled and stiff. The adult Condor paid no attention to the young bird until, after being warmed by Mr. Finley into renewed strength, it moved feebly, when the great bird drew it toward her with her bill and crouched gently over it.

It is an interesting fact that the head of the newly-hatched chick and that of the adult are bare of feathers, while in the immature bird the head for the first few years is covered with a dense coating of furry down.

On April 11th, a third trip was paid to the Condor's nest and the chick was found to have grown rapidly, and was covered with gray instead of white down. The head had become dull yellow, and most interesting of all, it had a voice,—a hoarse tooting, the only real note which any New World Vulture has ever been known to produce. As with brown pelicans, this is apparently soon lost.

On April 25th, when the young bird was thirty-five days old, it was as large as a hen. It showed fight at first, and strenuously objected to being carried out into the sunlight. During this and several later trips the fearlessness of the old birds was most noticeable. The adult birds became used to seeing Mr. Finley about and, as in captivity, would sometimes come within arm's reach and nibble at a glove or shoe. This of course gave splendid opportunities for photographs, and a large series of the old birds, both in flight and repose, was obtained. Mr. Finley says, "In all our study of the home life of these birds, there was never the slightest indication of ferocity on the part of the parents. Their attitude was one of anxiety and solicitude."

When fifty-four days old the young Condor was still clothed in gray down, and not until it was over two months old did the first black feathers appear on the wings.

On July 5th, when three and a half months of age, *General* was removed from his nest. At

this time he was not half feathered out but weighed over fifteen pounds. On July 7th he was shipped to Portland, Oregon, where he was kept, and by his affectionate disposition won the hearts of his friends.

In October of the same year he reached the New York Zoological Park. May he thrive for many years in his new home, and may his parents rear their future chicks in safety, and help to keep this splendid species from the catastrophe of extermination.

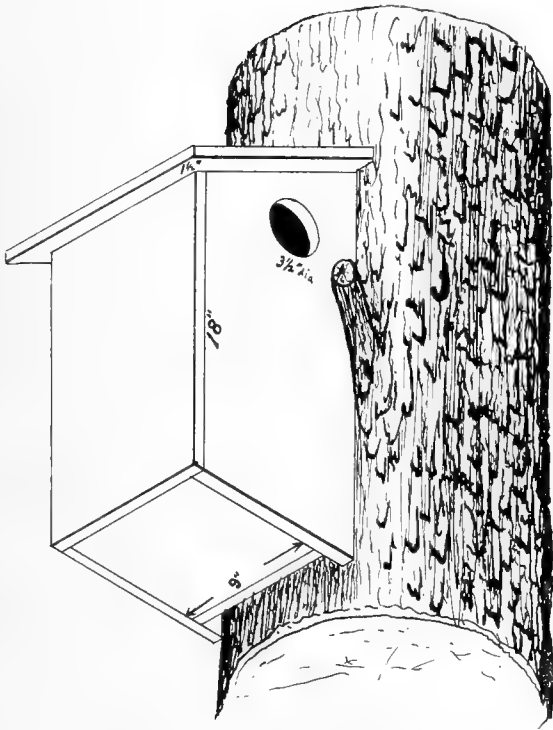
ACCLIMATIZING THE GRAY SQUIRREL.

IN view of all circumstances, it is rather surprising that so very few city parks in America contain colonies of gray squirrels. The squirrel itself is beautiful, its manners are very interesting, it accepts Park life with cheerful confidence, and every honest and intelligent human being delights in its acquaintance. To children, especially, it is a source of delight.

In any public park the society of the gray squirrel is procurable for an initial expenditure of about \$50 and we need not consider the cost per annum for maintenance. How can any village or city invest \$50 or \$75 in any other way which will yield as great dividends per annum as by effectively introducing *Sciurus carolinensis*? We cannot answer. And quite aside from the daily yield of human delight per squirrel, another great gain must be recorded. Squirrels in a public park teach children and restless boys to enjoy wild creatures *without killing them*; to love animals for their intelligence and their beauty, rather than as targets for small rifles; in short, to conserve and enjoy, instead of ruthlessly destroying.

How can a park be stocked with gray squirrels? The answer is easy. Make a dozen or twenty boxes, of bark-covered slabs if you have them, but otherwise of plain boards. Build each box like a small chimney, nine inches square inside, and about eighteen inches high. Saw off the upper end on a good slant, and nail on a one-board roof, twelve inches wide, so that it will keep out rain. Above and below, the roof should overhang generously, especially on the lower side. Put a bottom into the lower end, but bore a few small holes in it, to drain it in case water should ever enter the interior. Somewhere at the upper end of the box, in a position easily accessible *from the tree trunk*, cut a hole about three and a half inches in diameter.

Finally, nail the nest-box tightly in a crotch or against the trunk of any tree you please, about twenty feet from the ground. If red



BOX HOUSE FOR SQUIRRELS.
Showing method of attaching to tree trunk.

squirrels attempt to pre-empt your boxes, and drive out the grays, resolutely keep them in check by shooting a few of the former. When too numerous, the red squirrels easily become an intolerable nuisance, chiefly because of their industry in destroying the eggs and nestlings of wild birds.

If the trees of the grove or park are small, very erect, and contain few large horizontal limbs such as are beloved of the gray squirrel, mitigate the situation by nailing up many little brackets, of boards, on which the squirrels can comfortably rest and eat. In a public park that is infested by dogs running at large, it is well to place a few brackets about seven feet from the ground, in order that food may easily be placed thereon, above the reach of the natural squirrel-killers.

Like every other animal, the squirrel thrives best on a mixed diet. Corn is well liked, but only the germ of each grain is eaten. Unless a squirrel is very hungry, about two-thirds of each grain is wasted. Peanuts are good, but they induce habits of laziness. Small hickory nuts and filberts are the best for gray squirrels, because they make the little animal work for his meals, and wear down his incisor teeth. Acorns should be supplied in the autumn, provided the

grove produces no natural crop. Too much easy food fosters an over-development of the incisors, and sometimes leads to an abnormal and distressing development of one pair. Teeth that grow beyond reason, and distress the owner, are easily cut back with a pair of flat-nosed cutting pliers. In long periods of dry weather, or drought in midsummer, every squirrel colony needs a supply of drinking water.

Gray squirrels are easily purchased of Dr. Cecil French, of Washington, or Charles Payne, of Wichita, Kansas, and of many other dealers in live birds and mammals. Their cost price varies from \$9 per dozen to \$25, according to the distance they are to travel from seller to purchaser. If the distance is great, the crates must be made with much more care, and expense, than if the journey is short. Of course the best time to start a colony is in the spring, or summer; but with proper boxes and good care, it is quite safe to start in the autumn.

I regret to say that there are even yet many thousand Americans who regard the gray squirrel as "game," who kill it as such, and actually eat it! There are only four states, I believe, in which this species is protected by law. The gray squirrel bill that Mr. G. O. Shields induced the New York legislature to pass in 1907, was killed by the passive veto of Governor Hughes. In other words, the act lay upon his desk until it died of an attack of limitation.

W. T. H.

THE FIFTEENTH ANNUAL MEETING.

The fifteenth annual meeting of the New York Zoological Society will be held in the South Room of the Hotel Plaza, Fifth Avenue and 58th Street entrance, Tuesday, January 12, 1909, at 8.30 P. M.

Prof. Henry Fairfield Osborn, Vice-President of the Society and Chairman of the Executive Committee, will lay before the Society the plans of the Executive Committee for the protection of the Fauna of North America, with its recommendation that this work be undertaken on a large scale.

Mr. Charles H. Townsend, Director of the New York Aquarium will give a short illustrated address, entitled, "Color Changes in Tropical Fishes, at the New York Aquarium."

Mr. Clinton G. Abbott will deliver an illustrated address on "Expressions of Emotion in Birds, as Portrayed by the Camera."

Miss Mary C. Dickerson will give an illustrated address on "The Winter Life of Birds and Small Mammals."

By courtesy of the New England Forest, Fish and Game Association, a series of remarkable moving pictures of leaping Atlantic Salmon will be shown by Mr. Richard E. Follett, Vice-President of the Association.

Refreshments will be served.

ZOOLOGICAL SOCIETY BULLETIN.

Edited by the Director of the Zoological Park,
Elwin R. Sanborn, Asst. Editor.

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No. 32

JANUARY, 1909

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A GREAT ZOOLOGICAL PARK FOR FRANCE.

For several years we have wondered why Paris, the city of many expositions, has made no move to establish a zoological garden or park on a scale commensurate with the position of France among the great nations. The menagerie at the Jardin des Plantes is in the menagerie class, only; and the Jardin d' Acclimatation never was planned to contain a large and varied zoological collection. In view of the great zoological establishments of New York,

Berlin, London, Amsterdam and Antwerp, it has been cause for some surprise that the French capitol has made no move in the same direction.

Last year, when Dr. Gustave Loisel, of Paris, officially commissioned by the Department of Public Instruction of France, spent a week at the New York Zoological Park, studying it with a degree of systematic thoroughness and scholarly intelligence that was to say the least most unusual, it seemed quite certain that the effort was based on a serious purpose that might easily have been named. In our design, methods of development and general administration, there was scarcely a point that Dr. Loisel did not grasp and enter in his records. The workings and methods of our whole establishment were laid bare to him, and of publications, photographs and typewritten statements, we furnished a great supply. This material now makes in Dr. Loisel's report about 50 pages of text, which is embellished by a large series of illustrations, beautifully printed.

An American artist studying in Paris is now our authority for the news that the French government has announced its intention to establish a zoological garden on a grand scale, and devote to its development a very large sum of money. The animal painters and sculptors of Paris have been invited to submit suggestions for the facilities which they desire in the new institution in connection with their work. In pursuance of this request, the artist referred to has recently made a careful personal inspection of the studio in our Lion House, and the specially-invented transfer cage by which animals are placed in it, and withdrawn.

Naturally, we welcome the news from Paris with keen satisfaction. In view of the appalling destruction of wild-animal life throughout the world, there can not be too many zoological gardens and parks; and with all our hearts we wish the French undertaking unbounded success.

W. T. H.

BIRD SLAUGHTER AND ITS TERRIBLE RESULTS.

I have recently received a letter from Australia which seems of sufficient general interest and importance for publication. Its theme is the ill effects resulting from the indiscriminate slaughter of birds; by no means a novel subject for debate, but one which is becoming ever more vital to the multiplying myriads of human beings on the earth.

The statement of mine alluded to is, in brief, that if every bird in the world was suddenly to be wiped out of existence, the earth would,

within a period of ten years, become uninhabitable for man. C. W. B.

SYDNEY, NEW SOUTH WALES, AUSTRALIA,
Mr. C. W. BEEBE, September 12th, 1908.

DEAR SIR:—In one of our papers are quoted some remarks of yours on the value of birds to mankind. I wish to afford you certain information, to wit: In the sub-districts of Robertson and Kangaloon in the Illawarra district of New South Wales, what ten years ago was a waving mass of English Cocksfoot and Rye grass, which had been put in gradually as the dense vine scrub was felled and burnt off, is now a barren desert and nine families out of every ten which were renting properties have been compelled to leave the district and take up other lands. This is through the grubs having eaten out the grass by the roots. Ploughing proved to be useless as the grubs ate out the grass just the same. Whilst there recently I was informed that it took three years from the time the grubs were first seen until to-day, to accomplish this complete devastation; in other words, three years ago the grubs began work in that beautiful country of green mountains and running streams.

The birds had all been ruthlessly shot and destroyed in that district and I was amazed at the absence of bird life. The two sub-districts I have mentioned have an area of about thirty square miles, and form a table-land about 1200 feet above sea level. This is a verification of your statements.

I am, yours faithfully,

RICHARD WALTER TOMALIN.

HUNTING SONG-BIRDS.

Hunting song-birds in the vicinity of the Zoological Park, has narrowed down from numerous offenses, to extremely rare cases. However it has not ceased altogether, and but for the vigilance and courage of our game warden, John Rose, whose reputation in this capacity has become terrifying to evil doers, it would even now be carried on persistently. The offenses which now come to our notice are committed by foreigners who apparently are fully aware of the bird laws, but who think they can safely defy them. The character of the work involved in apprehending bird-killers is rather interesting.

On Sunday, November 23d, Warden Rose made a trip toward Hunt's Point, in the vicinity of the Sound, to investigate reported shootings in that locality. Hearing the sound of a gun he stalked through the undergrowth in the direction of the shots. Rose stalked his men to

the vicinity of a barn owned by a man named O'Hare, and came upon two Italians near the barn. Coming out of the bushes in the rear of the barn he spoke to the men, saying he had lost his brother and was hunting for him. Neither of the men had seen this imaginary boy, and the Warden was forced to depart.

Confident that these men were the offenders, Rose made a detour and concealed himself in the rear of the barn. A tedious wait finally resulted in the reappearance of the two men. At the right moment Rose quickly ran from his concealment, and caught one hunter emptying his pockets of dead birds. The other hunter ran into the barn with the gun. Rose drew his revolver, while holding one offender and forced the other to come from concealment. It was only upon a threat to shoot that the men surrendered. When the fact that they were under arrest became fully apparent to them, the bird-killers offered the officer their money and their watches in exchange for their release.

Marching the two men ahead of him, Warden Rose started for the nearest police station. After a walk of nearly two miles a car line was reached, the prisoners placed on board and after much difficulty landed at the Westchester Jail. Judge Welch, of the Eighth Division of City Magistrates' Court, after giving the offenders a severe lecture, held each of them in three hundred dollars bail for trial at Special Sessions. The men gave their names as Vincenzo Sacco and Antonio Guadagno, and their case has not yet been reached.

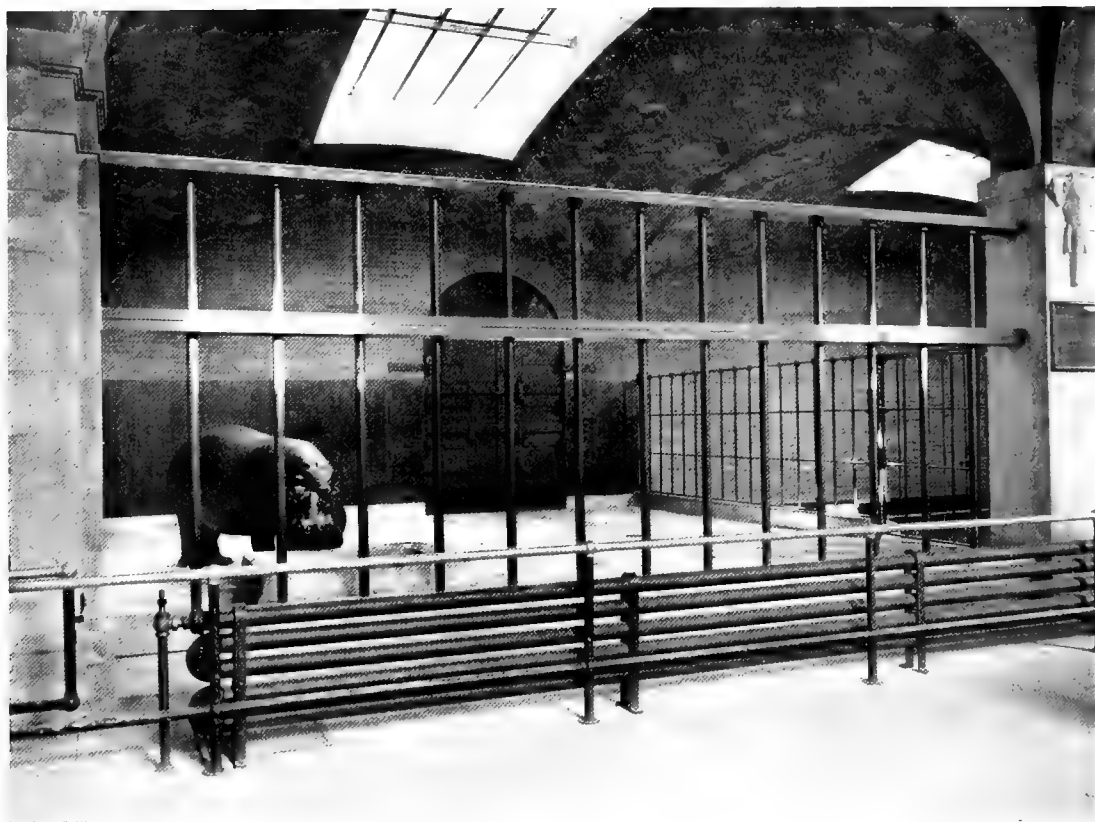
The birds in the possession of the hunters were retained by Warden Rose as evidence of their guilt. They were seventeen in number, and included the following specimens:—Three starlings, one brown creeper, three myrtle warblers, four chipping sparrows, three song sparrows and three seaside sparrows. Of course all these were intended to be cooked and eaten.

E. R. S.

THE OPENING OF THE ELEPHANT HOUSE.

On the nineteenth of November the "new" Elephant House in the Zoological Park was opened to the public with a full complement of specimens, excepting our Hippopotamus. An informal reception and first view of this splendid installation, given in the afternoon to the members of the Society, was the only ceremony which distinguished the completion of the most imposing building of the Park, which is well worthy of being regarded as the grand climax of our building operations.

E. R. S.



THE NEW QUARTERS FOR THE HIPPOPOTAMUS IN THE ELEPHANT HOUSE.
The low iron partition through the enclosure separates the main stall from the bathing pool.

HOW THE HIPPOPOTAMUS WAS MOVED.

EXCEPTING one, each stall in the Elephant House was occupied on the opening day. The empty one was that of the Hippopotamus, and for several days it remained untenanted. The problem which confronted Mahomet upon viewing the mountain, confronted the Director when the guileless "hippo" refused to leave his quarters in the Antelope House for his new home in the Elephant House.

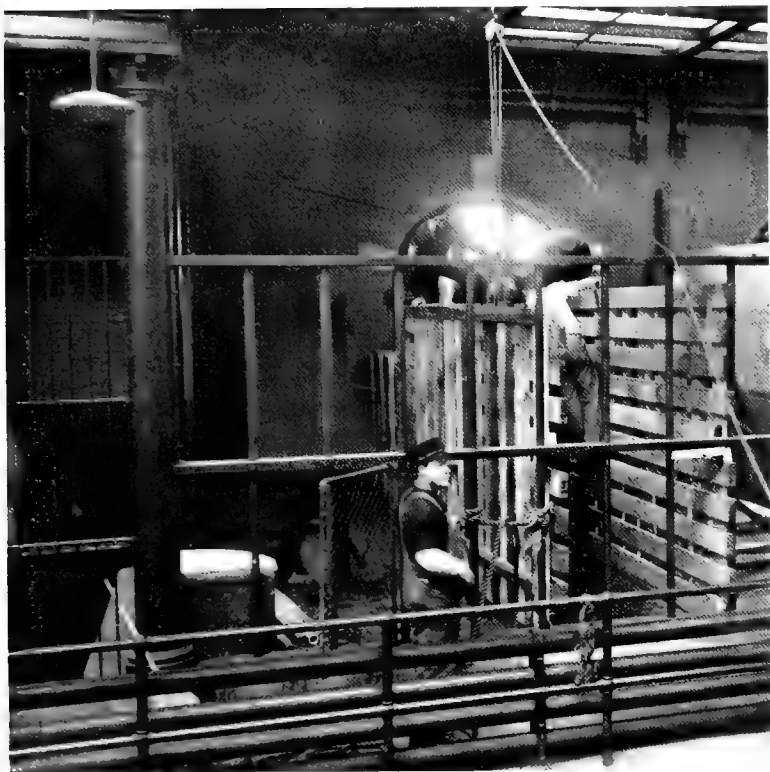
To the keepers the task had appeared so easy that no special preparations were thought necessary, excepting a means of conveyance. A horse ambulance was secured, large enough to hold the animal's great bulk. The sides of the vehicle were raised to a height of six feet, and the "hippo" was loaded in so easily that our trouble seemingly vanished like mist before the morning sun. No covering was put over the top, because the sides of the van were three feet higher than the animal's back.

In closing the end-gate preparatory to driving off, the noise startled the animal, and with

one frantic effort he reared up on his hind legs, and threw his fore legs and head over the side, breaking off the temporary boards. For a moment his plight was really serious. But by prompt and vigorous exertions on the part of the keepers, the Hippo was rescued,—badly frightened,—and returned to his quarters. The only alternative now was a crate, which was hastily constructed and put into the stall in the Antelope House, until the favorable hour for moving should come.

"Pete's" temper, a most equable one, was entirely unruffled. He viewed with calm indifference the confusion of the departure of the "rhinos" and elephants, and also the strange box in his quarters. Even the shortening of his rations had no visible effect upon his spirits, and the loss of his bath palled on him but a trifle. Such calmness augured well for complete success; merely lead him into his shifting box and away with him; but a trifling task.

Consequently on the morning of the opening day, the keepers assembled at the Antelope House prepared to finish the task with dispatch.



THE CHUTE AT THE ANTELOPE HOUSE.

The keepers are just securing the door of the shifting crate behind the captured "hippo."

The sliding door of the huge crate was raised, the floor of it was covered with straw and a bountiful supply of tempting vegetable food was placed in the extreme end. A fast of twelve hours gave to these preparations an air so inviting that "Pete" seemed eager to do his part.

All being ready, "Pete" awaited no invitation to enter. He started precipitately, entered with some caution, elongated himself tremendously and took a mouthful of food. The men were anxious to drop the rear door, but as eighteen inches of "hippo" remained outside, there was no way to do this. The "hippo" secured the food, and backed out. The crate seemed too short; and carpenters were summoned to add two feet, making a total of twelve feet.

The "hippo" regarded these activities with suspicion, and after that the food tempted him only to the extent of hastily securing a mouthful from the crate and backing out to devour it. The attempts to rush him in were savagely repulsed. Next in order the crate was placed in the open doors leading out to the yards, and an attempt made to rope "Pete" and drag him into it. The roundness of his body and limbs, and the smoothness of his skin made it impossible to hold him with a large rope, and a small one could not be used, for fear of injuring the animal.

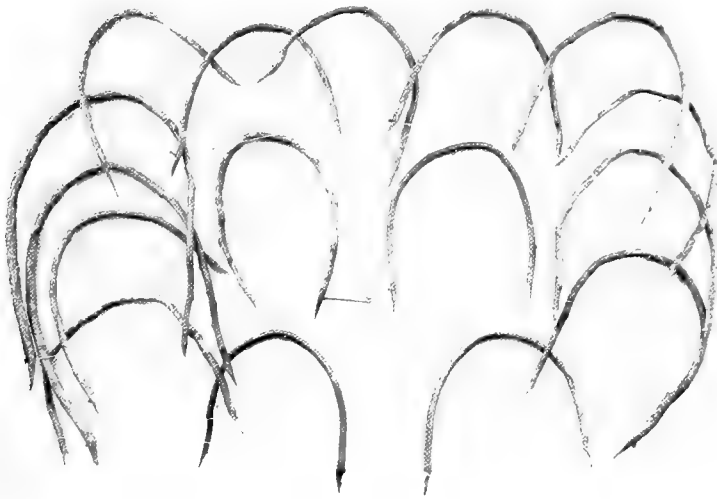
At this point the Director decided that it would be necessary to build a chute, and therewith force the Hippo into the crate; but the keepers asked permission to try their strategy.

During the following week, on each successive night, by alternate starving and coaxing, the keepers tried in vain to trap him. Even though he was enticed into the crate



ARRIVAL OF THE "HIPPO" AT THE ELEPHANT HOUSE.

The door of the crate was lifted and the animal walked into the stall without delay.



BOW-SNARES FOR CATCHING SMALL BIRDS.
The one in the left centre is set.

repeatedly, on each occasion he made use of his great strength to shove up the sliding door and escape. Finally it became apparent that this plan could not succeed, and then the Director ordered that his original plan be carried into effect.

The head of the crate was accordingly placed against the outside doors, and a barrier of heavy planking extended from one side of it to the steel cage-bars, in front. On the other side of the crate was erected a similar barrier, but sliding on rollers in such a fashion that it could be drawn quickly forward by a strong rope, also up to the cage bars. This side was left open, and the "hippo," now thoroughly hungry, was easily enticed half way into the crate. Once there, with a quick pull on the moving partition, he was securely fenced in, with his nose pointing straight at the opening of the crate. Whenever he moved forward, ever so little, a bar of heavy pipe was pushed across behind him. Foot by foot his retreat was thus cut off, until finally he was fairly crowded into the trap, the door dropped, and securely fastened. The time of this final operation was twelve minutes. Mr. Merkel's men then loaded the crate into the ambulance, and after a trip to the scales for weighing, "Pete" was unloaded safely in his quarters at the Elephant House, where he speedily plunged into the warm water of his huge new bathing pool.

For moving the rhinoceroses and the hippo, the large horse ambulance of the Bronx Brewers' Association was kindly loaned to the Zoological

Society through Mr. John C. Heintz, and it rendered most valuable service.

E. R. S.

ANOTHER BIRD-KILLING SCHEME.

THE accompanying illustration is an interesting piece of evidence of the ingenuity and merciless persistence of the song-bird destroyers who still occasionally operate in the woods and meadows above the Zoological Park.

On Sunday, December 6th, a number of snares were found near a small stream by Special Warden Rose during a trip north of the Park. The miscreants had cut runways in the brush.

through which the birds would walk to the water. At the ends of these runs the snares were planted in the ground in such a manner that the birds would be forced to come in contact with them.

The snare is bent like a bow by a double cord fastened to one end and passing through a small hole drilled in the opposite end. About six inches from the end of the cord is a running knot, forming a slip noose. Into this loop is inserted a small twig, making, when the trap is set, a horizontal perch about two inches above the ground. Naturally, as a bird comes to the end of the run, it jumps on the twig, the frail support falls, and the villainous device springs up, breaking the legs, wings or neck of the helpless victim.

Mr. Rose found and destroyed eight traps. Later on, he put up a covey of quail near this spot, which showed plainly how thoroughly the hunters knew the game. A few days later he returned to this place and found the twenty-one snares which figure in the illustration.

E. R. S.

ALBINOS IN THE ZOOLOGICAL PARK.

AN unusual number of albinistic mammals, birds and reptiles are at present on exhibition in the Park. Among the most interesting of the albinos in the collection are a coyote, woodchuck, Carolina squirrel, rhea, and a diamond-back terrapin. There are also several specimens in the collection that incline to-



ALBINO COYOTE.

wards albinism, which are almost as interesting as the fully-white individuals.

Albinism among snakes is not rare. From observations of a great number of litters of various species, the striped snake (*Eutaenia sirtalis*), shows the most common tendency in this direction. In a litter of forty-four specimens born in the Reptile House there were three perfect albino examples. They were yellowish-white, with pink eyes. For some time after birth these specimens were so translucent that when held to the light the internal organs could easily be traced and the heart could be seen beating.

A fully-matured albino striped snake was recently brought to the Reptile House by a boy, who had captured it as the reptile was crossing Jerome Avenue, in the Borough of the Bronx. This specimen had evidently been living in an isolated patch of woods, and had been seized with a wandering tendency often evinced by snakes. It was of a pale cream color, with pink eyes. The familiar pattern of the species could be faintly traced when the reptile was held in a bright light. The skin of this specimen was so

translucent that after a frog had been eaten, its presence was indicated by a distinct dark patch on the otherwise spotless skin of the reptile.

An albino diamond-back terrapin, (*Malaclemmys palustris*), is one of the most curious reptiles ever exhibited in the Park. In this instance albinism is not exhibited to the perfect degree as in the snakes described. Instead of the usual dark, olivaceous shell, the hue is a bright yellow, becoming reddish on the border. The head and legs are almost white, and faintly spotted, but the eyes are not pink, as with most pronounced albinos.

A tendency toward albinism among reptiles sometimes results in startling combinations. A Florida striped snake was once received that exhibited a uniform coat of fiery brick-red. To add to its unusual aspect, this reptile possessed a white tongue, which when in play imparted the effect of the snake ejecting a pale fluid from the mouth.

Our albino mammals are interesting from the fact of their being snowy-white, with limpid pink eyes. The white coyote represents a most unusual phase among wolves. Owing to his be-



TAMANDUA: PREHENSILE-TAILED ANTEATER.

ing quartered in an adjoining cage to the pair of black-phase coyotes from Wyoming, his appearance is particularly impressive. The milk-white gray squirrel presented by Mr. G. O. Shields nearly five years ago is yet living in the Small-Mammal House in good health.

R. L. D.

ITEMS OF INTEREST.

Zoological Park.

The Nighthawk.—Members of the Order MACROCHIRES, including the chimney swifts, hummings and nighthawks, are among the most difficult of birds to keep alive in captivity. This is primarily because of the extreme specialization of their feeding habits, all except the hummingbirds being exclusively flycatchers, seizing their prey while in full flight.

A nighthawk was recently received at the Park, being slightly injured by flying against a telegraph wire. The injury soon healed and the bird, after being forcibly fed for a week, learned to take food from the keeper's hand. It has now been in captivity over a month and has adapted itself to its unusual surroundings in a way which promises long life.

Its favorite position, true to the custom of its family, is lengthwise upon a small prostrate tree-trunk. At the approach of a keeper with food, the bird flies down to the door and greets

the man with its great mouth wide open and wings quivering with eagerness. Pellet after pellet of meat, egg and meal-worms is caught and swallowed, until the bird signifies its satiety by flying back to its perch. Few people have seen a nighthawk or a whippoorwill alive, and this bird attracts a great deal of attention.

Weight of the Elephant House Collection.—

The aggregate of the specimens now in the Elephant House, not including the Tapirs, is 20282 pounds; the weights of the individuals being as follows:—Indian Rhinoceros, 1010 pounds; Male African Rhinoceros, 602 pounds, Female African Rhinoceros, 1080 pounds; West African Elephant, 1170 pounds; Male Sudan African Elephant, 1460 pounds; Female, 1290 pounds; Male Indian Elephant, 6800 pounds; and the Female Indian Elephant, 4500 pounds.

In four years "Gunda" has increased in stature from six feet and seven inches to eight feet, two and one-half inches, and his increase in weight amounts to 3060 pounds.

E. R. S.

The Sea Lions.—The Sea-Lions have been removed from their summer pool on Baird Court to the large enclosure just vacated by the Hippopotamus in the Antelope House. Thus far the Sea-Lions have had rather a trying time during the winter season, chiefly on account of



TREE PORCUPINE.

An interesting little porcupine, caught by Curator Beebe in Venezuela.



PIG-TAILED MACAQUE.

their predisposition to *pneumonia in spring*. This large swimming tank now available will keep them quite comfortable until mild weather.

SOME INTERESTING FISHES.

AS a gift from Mr. Otto Eggeling, an aquarist of this city, we have placed on exhibition on the main floor of the Reptile House, a tank containing a collection of rare Indian fishes. The most interesting among these is a pair of Climbing Perch, (*Anabas scandens*). Specimens of this remarkable fish were first imported by Mr. Eggeling to this country in 1903, from Calcutta. The remarkable feature of the life history of this fish, is the fact that it is able to live out of water for hours at a time. While a few other fishes are able to do this to a limited extent, the Climbing Perch is one of the very few which, under certain conditions, leave their natural element and travel overland, or even climb the trunks of trees to a height of six or seven feet.

The gills and fins are provided with sharp teeth which the fishes use with great skill to "walk" over the ground. Whenever the sun evaporates a body of water in which examples

of this species live, the fishes emigrate in masses to other waters; or, if these should not be found, they bury themselves in places sufficiently moist to keep them alive until the rains make further progress possible.

The Climbing Perch is found usually in Southern India, Ceylon and the East Indies, in shallow or stagnant water. In the aquarium, it becomes very tame. Owing to its wandering disposition, it is liable to jump from the tank, and for this reason a wire gauze covers the aquarium containing our specimens.

R. L. D.

THE NEW ADMINISTRATION BUILDING.

THE members of the Zoological Society will be pleased to know that the erection of the Administration Building is actually in progress. At the moment of going to press with this number of the BULLETIN, the foundations are finished, and the erection of the structural steel is well under way. It is now reasonably certain that in the autumn of 1909 this long-needed building will be ready for practical use. The members of the Society can then enjoy the "Heads and Horns" collection, the Library, Art Gallery, offices and reception rooms, for all of which ample space has been provided.

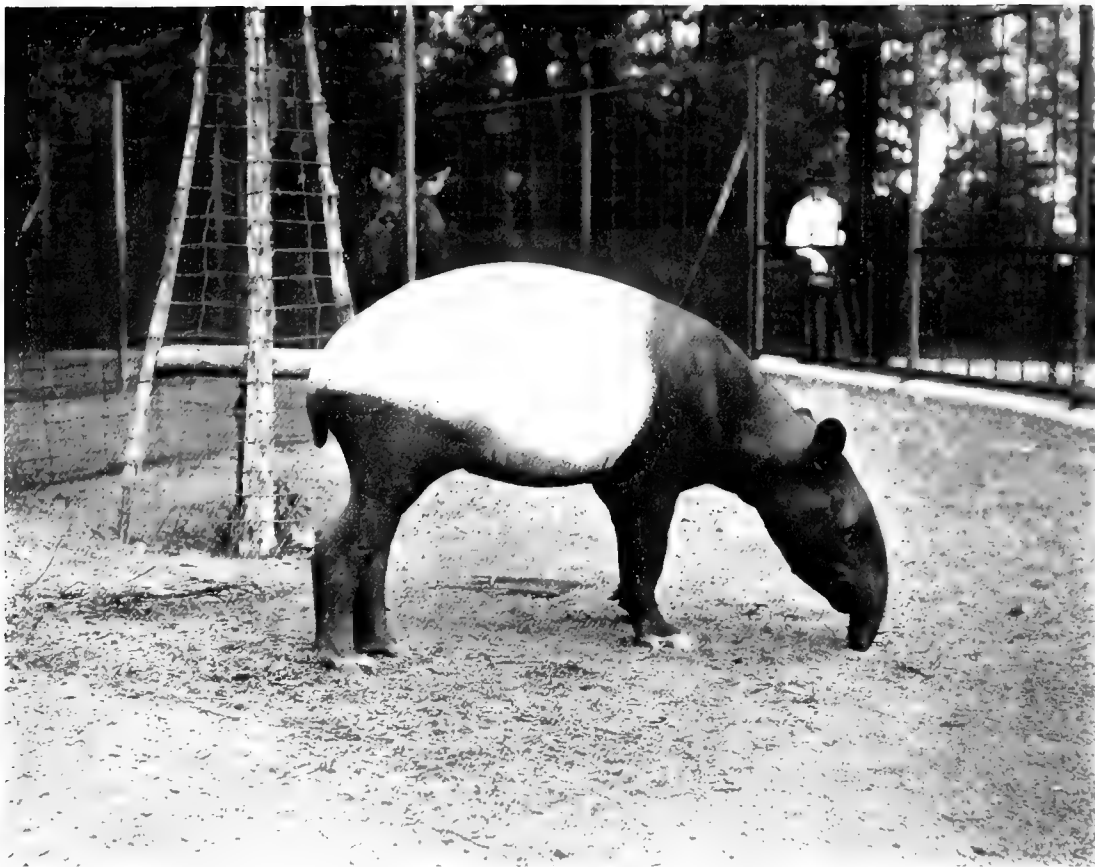
The building has been located at the northeast corner of Baird Court, directly opposite the Bird House. Architecturally it will be entirely in harmony with the other buildings of Baird Court.

E. R. S.

A RARE SERPENT.

ANOTHER specimen of the Bushmaster, (*Lachesis mutus*), has been placed on exhibition in the Reptile House. Like all of our other specimens of this rare and deadly snake, the present example came from the island of Trinidad. It is the gift of Mr. Edward Wheelock Runyon, who procured the reptile for the purpose of obtaining some of its venom for scientific purposes.

Venom is extracted from a snake in a very simple fashion. A piece of cheesecloth is tied over the top of an ordinary glass tumbler. The snake is captured by pressing its head against the ground with a stick, when it is grasped by the neck, immediately behind the head so that it cannot turn and bite in either direction. Its jaws are then applied to the cheesecloth, through which it bites viciously. When the fangs are through, the operator compresses the reptile's poison glands, emptying out more venom than if



MALAY TAPIR: SADDLE-BACK TAPIR.

So called on account of the conspicuous area of white hair on the back and sides.

the snake bit normally. The venom is pale yellow, and dries rapidly. It then forms into coarse scales which look like amber.

The Bushmaster inhabits tropical America. It is the largest of the poisonous snakes of the New World, and has enormously developed poison-conducting fangs.

R. L. D.

THE MALAY TAPIR.

THE Elephant House was opened with the Tapir Family well represented. To transport a tapir all the way from Singapore to New York and complete the voyage with the animal in perfect condition, is a noteworthy achievement. This was accomplished by Captain Percy Watson, of the Steamer "Muncaster Castle," who brought us our first example of the Malay or "Saddle-Back" Tapir, (*Tapirus indicus*). When the "Muncaster Castle" was coming through the Red Sea, a fire broke out in her hold directly under the heavy tapir cage,

which was fastened to the deck. The steel deck-plates became very hot and after great difficulty the crate was moved to another spot further forward. Soon after that the fire gained in fury, the steel deck became white hot, then caved in. Had not several cruisers been sighted at that moment we would yet be looking for a "Saddle-Back" Tapir. Tons of water were pumped into the vessel's hold from all sides and the fire was conquered.

About five species of Tapirs are known, only one of which is found in the Old World. We now have on exhibition in the Elephant House, the two best-known species. The New World representative is the South American Tapir, (*Tapirus terrestris*). Of this species we have a mother and young, the latter now so well grown that it shows only very faintly the vivid striping that so strongly characterizes the young when first born. The specimens of both species are exhibited in cages at the eastern end of the Elephant House.

R. L. D.

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Aquarium Number
PREPARED BY THE DIRECTOR OF THE AQUARIUM

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April, 1909

THE BERMUDA AQUARIUM.

AN aquarium located in the tropics has many advantages over one established in a region where cold weather prevails in the winter months. It has not only the marvelously varied life of warm seas to draw upon, but has the supply so close at hand and so abundant that its collections may be changed frequently with little expense.

The temperature of its water supply requires no costly artificial regulation, and the various foods necessary to the welfare of its occupants are always obtainable. The mere changes of the seasons in the north involve a northern aquarium in heavy expenses.

In these respects the aquariums now established in the Bermuda and Hawaiian Islands possess advantages of location which it would be difficult to surpass.

The Bermuda Aquarium is as yet but half completed. It occupies the site of an underground powder magazine, the interior of which is 100 feet in length by 67 feet in width. It is divided into five transverse chambers with arched ceilings of masonry. A lengthwise passage crosses all the transverse chambers, dividing the Aquarium into two sections, the southern being completed. In the ends of each transverse chamber, are either two or three glass-fronted tanks, the tops of which are open to the daylight and the outer air, the chambers themselves being decidedly dark. There are twelve tanks in the completed section. The general effect is suggestive of the Trocadero Aquarium in Paris, which is built in the bottom of an old quarry with all tanks extending up to the level of the grass in the park above.



THE AQUARIUM AND BIOLOGICAL STATION, AGARS ISLAND, BERMUDA.

The entrance to the Aquarium is indicated by the arrow.
From a photograph by L. L. Mowbray.



ENTRANCE, BERMUDA AQUARIUM.
Photograph by C. H. Townsend.

With the completion of the tanks across the northern section, the Aquarium will have about thirty tanks, affording space for a considerable variety of fishes and invertebrates. The species at present on exhibition are in general the same tropical forms usually to be seen at the New York Aquarium. In fact the tropical fishes now in New York were secured through the co-operation of the Bermuda Aquarium, a convenient arrangement as it enables us to get fishes that have been "seasoned" in the tanks at Bermuda.

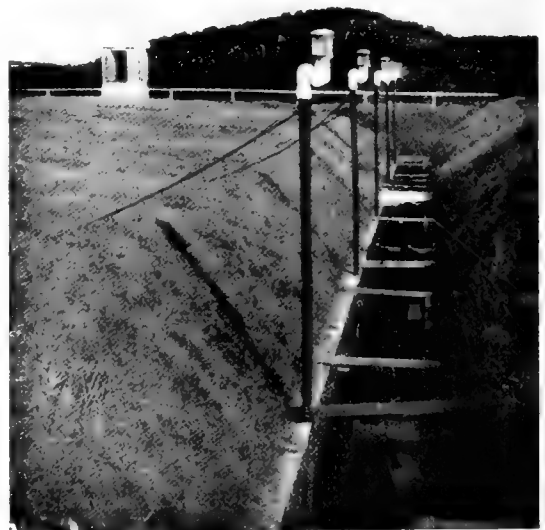
A tank of large and showy sea anemones is one of its attractions, which it may not be easy to repeat in the New York Aquarium, owing to the difficulty of transporting the specimens without injury.

It contains several species, among which are the gill-bearing anemone, (*Lebrunea danae*), about eighteen inches in diameter which is of a brownish color; the pink-tipped anemone, (*Condylactis gigantea*), which varies greatly in tint, often yellowish or white with purple-tipped tentacles and spreads out a foot or more; the little red anemone, (*Actinia Bermudensis*), and the white-specked anemone, (*Aiptasia tageter*), a flat species with short tentacles. Most of these are shown in the accompanying photograph.

Another picture shows the octopus tank at the Bermuda Aquarium. Additional specimens of these will be procured for the New York Aquarium, it is hoped with better results than attended the shipment made last summer when the specimens were all injured during transportation either by fighting or by a too low temperature of the water.

Around the five transverse chambers composing the Aquarium, runs a narrow moat of masonry called the "lighting passage" when the whole structure was a powder magazine. This moat, four feet wide, extends up to the general level of the ground above—about thirty feet—and is open to the sky. In its bottom all the tanks are built the full width of the passage, the glass fronts facing inward through cuttings in the end walls of each transverse chamber. All tanks are four feet wide and four feet deep, the largest being eight feet long, the others four.

The lighting of the tanks is perfect, since their tops are open to the sky, and the mildness of the climate renders glass roofing for them unnecessary. Rainstorms do not materially affect the salinity of the flowing sea water with which all the tanks are supplied. The lighting of the interior will be greatly improved with the completion of the north side tanks. If additional light is desired it can be secured by cutting light shafts through the ceiling of the central passage.



LIGHTING PASSAGE, BERMUDA AQUARIUM.
View of the lighting passage looking down on the tanks. The grass-covered section to the left is the top of the Aquarium.
Photograph by C. H. Townsend.



OCTOPUS, BERMUDA AQUARIUM.
Photograph by L. L. Mowbray.

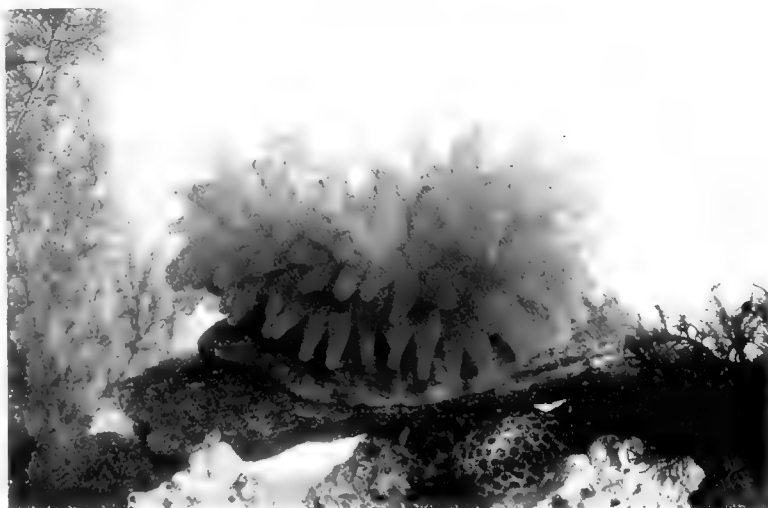
The ventilation is excellent, each chamber having air tubes extending above the general level of the embankment.

The Aquarium is furnished with sea water from a reservoir of stone and cement holding 40,000 gallons and situated well above the level of the tanks, to which the water flows freely. The reservoir is supplied from a well dug in the coral rock near the shore, the water being pumped through a three-inch pipe, by a two-horse-power oil engine. A windmill is used as an auxiliary to the engine. The water from the well is always clear.

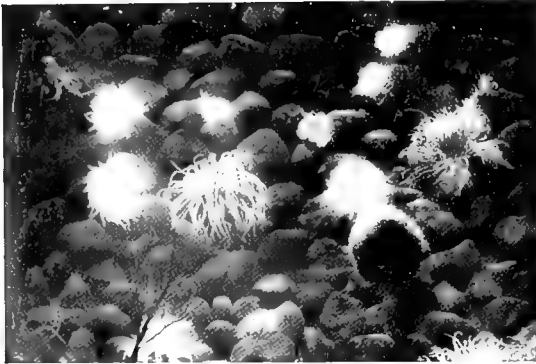
The Aquarium, as has already been stated, is an underground structure. Viewed from above it is a rectangular, flat-topped, grass-covered mound, or hill, there being eight feet of earth on top of the masonry. It is situated on Agars Island two miles from Hamilton, and is reached by boat or carriage, the latter involving a transfer of about 100 yards by rowboat.

There are several ordinary buildings of masonry on the island, including two cottages as quarters for officers. The old barrack room is now a well-lighted biological laboratory, with adjacent kitchens, wash-rooms, photographic room and library. Other buildings serve as warerooms, boat houses and offices. The island has a good dock of masonry, and three fresh water reservoirs. It is much in need of a causeway across the reefs, for the greater convenience of visitors.

The Aquarium is a public institution conducted by the Bermuda Natural History Society, in the interest of science. The proceeds from the admission fees of the Aquarium are devoted to the establishment and maintenance of laboratories for the use of scientists and students from abroad. In 1907-08 there were twenty-nine students of biology from the United States and Canada in the laboratory. Funds are also derived from membership dues and popular subscriptions. The principal donors to the Society



CRIMSON ANEMONE, (*Tealia*).
Photograph by L. B. Spencer.



SEA ANEMONES, BERMUDA AQUARIUM.
Photograph by C. H. Townsend.

have been Mr. James Gordon Bennett, of New York, and Mrs. Reid, of Bermuda.

The Aquarium is in charge of Mr. Louis L. Mowbray, curator of the Bermuda Museum of Natural History. There are at present two caretakers. The establishment, including the biological laboratory, has two motor launches and two row boats. A good-sized sloop with a "well" for living specimens is hired for collecting purposes.

The institution is of great interest locally and is well patronized by the numerous tourists visiting the islands in winter. Local excursion boats call regularly at the Aquarium.

Like the New York Aquarium the structure occupied by the Bermuda Aquarium, had its beginning in military necessities. While the former is the transformation of an old fort, the latter is a converted powder magazine, and both are of ponderous masonry.

A TROPICAL FISH POND.

A GREAT pool of the clearest sea water containing about two hundred brilliantly colored fishes of large size, is one of the sights pointed out to all visitors to the Bermuda Islands.

To call it a fish-pond is scarcely correct. It might better be described as an open-air aquarium, but to the Bermudians it is simply *The Devil's Hole*. This natural pool appears to be about a hundred feet in diameter, by fifty in depth. It is situated less than a hundred yards from the shore of Harrington Sound and although the tides rise and fall within it, the underground sea connections are not large enough to permit of the escape of the fishes.



THE DEVIL'S HOLE, BERMUDA.
Photograph by W. Weiss.



BULLFROG.

Photograph by L. B. Spencer.

It is entirely a work of Nature or rather of the Sea, being merely an exposed sea cavern, the roof of which collapsed long ago. Its ragged coral walls are overhung with trees and vines.

The collection which has been brought together in the Devil's Hole consists chiefly of the larger food fishes of the Bermudas, such as groupers and hinds, with many showy species including angel and parrot-fishes. The large size of the specimens, their richness of coloration, their surprising tameness, and sudden changes of color when food is thrown among them, make an exhibition pleasing in every way.

The accompanying photograph shows only a small portion of the Devil's Hole and its collection of fishes.

FROGS AND FROG-RAISING.

IN the Laboratory of the Aquarium there is a shallow wire-covered tank containing about twenty young bullfrogs. They are the representatives of a number of very burly tadpoles which lived in one of the large exhibition tanks last summer and furnished to visitors an object lesson in frog development. There were tadpoles of the plain long-tailed sort, tadpoles with short tails and one pair of legs, tadpoles with stub tails and two pairs of legs, and young frogs with no tails at all. People asked about them and

wanted to know if they were easy to raise, how fast they grew and what was to be done with them. A few of the smallest were eaten by the larger ones, and a few were given away for the use of zoological classes in the universities of the City and so did not get a chance to develop into full-sized croakers, but the rest just stayed where they were and had nothing to do but grow. When winter came they were moved to warmer quarters, where they thrived, and when spring came were fairly good-sized frogs—for eight months' growth.

The keeping of these frogs indoors during the winter is a matter of more importance than may be supposed, since a good many persons seem disposed to undertake frog raising and seek in vain for satisfactory information on frog culture. The Aquarium gets its share of the inquiry, but the fact is, a good system of frog propagation has yet to be worked out. The Pennsylvania Fish Commission is carrying on experiments and had at last accounts, distributed 140,000 young frogs to prospective cultivators, in response to fully a thousand applications from various parts of the State. The Fisheries Bureau at Washington distributes certain information on frogs with brief suggestions on frog culture, but has not yet undertaken to propagate them. Our marshy wastes can be made profitable by frog raising and private as well as public experiment is desirable. The present brief notes on what is known of the subject are presented more in the hope of arousing interest than of stating just how frog raising should be done.

It is not generally known that more frogs are eaten in the United States than in France, and that the annual crop of American frogs sent to market is a large and valuable one. Moreover the frog supply is by no means equal to the demand. According to the last Government statis-



FOUR STAGES OF DEVELOPMENT OF THE FROG.

tics of the fisheries of the Mississippi River and its tributaries, the single item of frogs for that region was stated at 336,049 pounds, valued at \$24,783. The Fish Commissioner of Pennsylvania has recently stated that the annual catch of wild frogs in the United States is worth fully \$200,000 to the consumer. It is officially reported that more frogs are taken in New York than in any other State.

The American bullfrog, (*Rana catesbiana*), is not only larger than the edible frogs of Europe, but the largest of all frogs. We have also a few other species which grow large enough to be important for food, such as the spring frog, (*Rana virescens*), the green frog, (*Rana clamata*), the leopard frog, (*Rana pipiens*), and some western species; but the bullfrog and the green frog are the largest and most promising. They are also widely distributed, being found throughout the entire Eastern and Middle States.

According to Government fishery statistics, the first value of frogs sent to market averages fourteen cents a pound, but in some sections the prices received are much greater. They also depend largely on the size of the frogs.

The cultivation of frogs in paying quantities is complicated by their peculiar habits, dependence upon live food, cannibalistic tendencies and numerous natural enemies.

The procuring of eggs is not difficult, since they may be found in all sorts of ponds and stagnant waters early in the spring. The eggs are deposited in jelly-like masses in shallow water and are easily dipped up and transferred. They can be hatched in wire-bottomed troughs anchored in flowing water, and will of course hatch in the ponds where they are found if the egg masses are protected. The eggs hatch in a week or two, according to temperature. Toad eggs need not be mistaken for frog eggs, since the former are not laid in masses but in strings. In the tadpole as well as the mature stage, frogs have many natural enemies, both on land and in the water. They are eaten by many kinds of birds, snakes, fishes and small mammals. The larvæ of water beetles are especially destructive to the tadpoles, and if the beetles are not constantly removed with a net, thousands of tadpoles will be destroyed by the larvæ in the pond every day. The feeding of tadpoles is not difficult. They devour dead animal matter of all sorts and will swarm thickly around meat, liver or fish, consuming it rapidly.

After they develop into frogs live food is necessary. They eat worms, beetles, spiders, crickets, grasshoppers, caterpillars, crayfishes, small frogs and fishes, in fact, any living thing they are able to swallow.

Our Aquarium frogs subsist largely on live minnows, but they can also be taught to feed on fresh meat, small strips of which are presented to each frog on the end of a slim stick.

Large specimens have been seen trying to swallow the baby alligators formerly kept in the tank with them. For the pond, however, minnows and tadpoles represent two kinds of foods usually available. Chopped meat placed about the shore of the pond will attract insects and it is said the frogs thus brought in contact with the meat will learn to eat it. The feeding of large numbers of frogs is the chief problem to be worked out.

As the larger species of frogs may remain in the tadpole stage a year or more, the prospective frog culturist can gain time by stocking the pond with large tadpoles collected from various localities.

Yearling tadpoles are easily obtained. In my frequent canoe trips along the upper Delaware River I have found them swarming in the warm, shallow side channels and had little difficulty in collecting them with a dip net. In such places I have also secured very large adult frogs with the dip net.

Fish Commissioner Meehan, of Pennsylvania, has recently announced as a result of experiments conducted under his direction, that we are wrong in supposing that the bullfrog and green frog remain a year in the tadpole stage. He finds that under cultivation at least, they mature before autumn and further has obtained some evidence that they spawn *twice*, the tadpoles of the late spawning being probably the ones that remain undeveloped through the winter. If this is true it means a distinct advance in frog culture.

The pond should have a depth sufficient to protect its bottom from freezing, and the bottom must be soft enough to permit the frogs to bury themselves for their winter sleep. Bullfrogs will require a deeper pond than other species, but all ponds will need shallow margins, where the tadpoles will not only find warmer water, but readier access to the air, both of which facilitate their development into frogs. If kept in deep water, even in aquaria the tadpole stage may be indefinitely prolonged. It

should be protected with a close fence of boards or wire netting not only for the protection of the frogs from enemies, but to prevent their wandering away—a propensity which it is not easy to guard against.

As in the raising of fishes, it is necessary to separate frogs of different sizes, to prevent cannibalism. Several ponds will therefore be required and the small tadpole pond will naturally be the first one constructed, while a half-acre pond will not be too large for well-grown frogs. Ponds will need a margin of grass and bushes, since frogs are land as well as water animals, and like the shelter of shrubbery along shore. They should also have the protection of lily pads.

NEW FUR SEAL SERVICE.

THE administration of the Pribilof Islands in Bering Sea has recently been transferred to the United States Bureau of Fisheries, and the Secretary of the Department of Commerce and Labor has appointed an Advisory Board, which under the general direction of the Bureau, will have charge of all matters of administration with a view to putting the new *Fur Seal Service* "on the most rational basis possible." Mr. Charles H. Townsend, Director of the New York Aquarium, has been appointed a member. He was a member of President Cleveland's Bering Sea Commission of 1896-97 and was previously, for several years, the government inspector of the fur seal rookeries on the Pribilofs.

FEES FOR MEMBERSHIP.

The fees for membership in the New York Zoological Society are as follows:

| | |
|-------------------------|-----------|
| Annual membership | \$ 10.00 |
| Life membership | 200.00 |
| Patron's fee | 1,000.00 |
| Founder's fee | 5,000.00 |
| Benefactor's fee | 25,000.00 |

Information and blank forms for membership may be obtained at the Service Building, at all entrances to the Zoological Park, and at the Secretary's Office, No. 11 Wall Street, New York City.

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WATER-THROWING HABIT OF FISHES IN THE NEW YORK AQUARIUM.

In a recent publication of the Smithsonian Institution, Dr. Theodore Gill presents a history of the Archer Fish, (*Toxotes jaculator*), and its feats in shooting drops of water at small insects. This peculiar habit was recorded in 1764, but appears to have lacked verification until 1902, when specimens were kept in aquaria by Zolotnitsky, a Russian ichthyologist.

Ordinarily these captive fishes were able to project drops of water from ten to twenty inches, but sometimes as much as forty inches.

They could shoot drop after drop at an insect lodged on the vegetation close to the water, until it was drenched and fell within their reach. The old fishes are described as much more successful in their aim than the younger ones, but the latter sometimes shot flies with such force that they fell outside of the aquarium. According to Zolotnitsky's account the fishes shot the drops without actually protruding the mouth above the surface.

The water-throwing habit may be more common among fishes than has generally been supposed. Certain fishes living in the New York Aquarium have the habit of coming to the surface and squirting water upon the hands of the attendants working about the tanks, and I have frequently observed it myself. The species in which the habit is most confirmed is the Trunk Fish, (*Ostracion triquetrum*).

When the large exhibition tanks are approached from the service passage, into which their tops open, these fishes frequently come to the surface, and projecting their mouths just above, proceed collectively and individually to squirt water into the air in considerable quantities. About half a teaspoonful at a shot is the amount thrown upward. The fishes are quite tame, and readily nibble at ones fingers. This habit is also frequently practiced by two other small-mouthed fishes with restricted gill openings; the Trigger Fish, (*Balistes carolinensis*), and the Spiny Boxfish, (*Chilomycterus schoepfi*), but is more pronounced in the former.

A few months ago when gas lights were placed over the tanks within eight inches of the water, the attendants reported to me that the trunk fishes and the trigger fishes were squirting water at the lights when first turned on and sometimes put them out. I have not observed this myself—doubtless because I did not give instructions to be called when the lights were lit—but the men have undoubtedly seen the fishes do it many times. The trigger fish squirts water forcibly enough to throw it quite out of the tank.

All of these fishes are full of curiosity and seem to be ready to come to the surface to investigate any movement taking place about the open tops of the tanks. The putting out of the lights by the trigger fishes is doubtless accidental, as they squirt water quite as readily when the tanks are not illuminated and apparently do it merely in play.

THE SOLUTION OF THE CARP PROBLEM.

A dozen years ago, only a very few students of the fisheries of the United States, believed that any good could result from the introduction of the European carp into America.

These few were studying the supply of food fishes in our markets and held steadily to their opinion that this marvelously productive fish was needed in our waters, because of the fact that it breeds abundantly in streams which on account of many forms of pollution, are being deserted by native species. Our extensive fish cultural work—the most effective the world has ever seen—is already very seriously hampered by the condition of the rivers wherever the population is dense and manufacturing industries well developed. Some branches of the fish cultural work might as well be abandoned until the American public appreciates the fact that sewage and factory wastes are ruining our waters, and destroying the supply of certain native fishes formerly of great commercial value.

A change cannot be expected very soon. In the meantime we are throwing into the breach more than twenty million pounds of carp a year, caught in thirty-five different States.

The increasing value of carp in the markets is not its only importance; fish culturists everywhere recognize its value as *the chief food* of some of the best native fishes.

The Fish Commissioner of Pennsylvania, who for many years has maintained that the introduction of carp was a mistake, announces at some length in a recent report, that its growing value for food purposes in the great cities cannot be overlooked. More than two million pounds are sold in Philadelphia yearly, sometimes at prices exceeding ten cents a pound.

New York uses about eight million pounds of carp a year, and the weekly market reports this winter have frequently quoted it at seven cents a pound. Its high price is due in part to the fact that some of the supply is sold *alive*.

The Illinois River contributes very largely to the carp market, and a recent report gives the carp catch of this river, from September 1 to December 15, at nine million pounds, the out-

put going to New York, Philadelphia, Boston, Louisville, Nashville, Chattanooga and Memphis.

The report of the Wisconsin Fish Commission for 1908, states the following respecting the fisheries of the Mississippi River and its tributaries in Wisconsin, the Mississippi being the western boundary of that State: "The carp is the principal fish caught. The fishermen on these waters are making more money by catching and marketing carp than they ever made in past years from all other kinds.

"As an indication of what the Mississippi River carp fisheries amount to a fish dealer located at Bay City, Wisconsin, states before the Fish and Game Committee of the legislature of 1907 that he was one of four principal buyers of fish along the Mississippi River in our State and that during the previous winter he had shipped one hundred and fourteen car loads of fish for which he paid \$127,000.

"Sharp, Spriggles and Amoth of Bay City, Wisconsin, caught, in December, 1907, with one haul of a seine seven hundred feet long, 55,000 pounds of carp for which they received four and one-half cents per pound.

"In the fall of 1907, Mr. L. F. May caught in a single haul of a seine 90,000 pounds of fish, principally carp. From this haul he marketed 71,660 pounds for which he received \$3,171.42. The 'No. 1' carp brought him from five to five and one-half cents per pound. During the year 1907 he marketed 216,822 pounds of fish, over one-fourth of which were dressed before weight was taken. More than three-fourths of the entire catch for the year were carp. His income from fishing during the year exceeded \$10,000. These are instances which have come to my notice. Doubtless others have done as well."

"New York is the principal market for the carp and buffalo fish caught by the Mississippi River fishermen."

The preceding are only a few of the statements respecting the carp fishery in the numerous reports of the year from State commissioners. If the recent yearly increases in the price of carp continue, we shall materially reduce the numbers of the carp and at the same time find it a source of profit and an important item in the supply of fish food.

The "carp problem" of a few years ago is undoubtedly settling itself.



WATER POLLUTION BY A SAWMILL, DELAWARE RIVER.
Photograph by W. F. Patterson.

ANGLING AND WATER POLLUTION.

THE Report of the New York Zoological Society for 1907 contained an article on *The Pollution of Streams*, in which mention was made of the widespread practice of polluting waters with the refuse of sawmills. Two of the pictures in this number of the BULLETIN show how sawdust is thrown into the Delaware River. One of the mills is situated at Rock Eddy, on the East Branch of the river above Pepacton, New York. The other is also on the East Branch, above the mouth of the Beaverkill. Year after year these, and other mills like them, throw tons of their waste into one of the finest black bass and canoeing streams in New York.

It is an amazing fact that there are over six hundred concerns of this sort in the State. Sawdust blackens the water and settles into the gravel beds, making them unsafe for fish eggs and fry. Government experiments have shown that sawdust in the water promotes the growth of fungus on fish eggs and kills both eggs and young fishes.

There can be no more inexcusable practice than that of disposing of sawdust by

throwing it into a stream. There are always places on land where it can be deposited without its becoming a nuisance, and it can always be burned. The numerous angling associations of the United States can render a most important service to the country by forming leagues for the enforcement of existing laws against the pollution of waters by sawdust and other wastes injurious to fish life. At present it is almost impossible to prosecute offenders owing to the existence of local

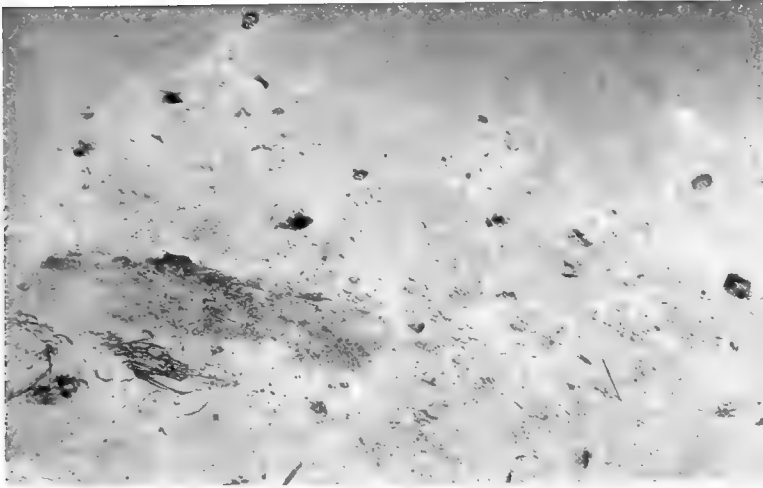
sentiment in favor of the industries which offend. Very little can be expected from local juries. The fight against the pollution of angling waters must be made by powerful State organizations, who can keep up the struggle from a broad point of view, until the justice of their side results in success.

A PHOTOGRAPHIC STUDY OF THE GHOST CRAB.

WHILE spending some days along the extensive sea beaches near Cape Hatteras, I was entertained early and late by the lively behavior of the Sand or Ghost Crabs,



WATER POLLUTION BY A SAWMILL, DELAWARE RIVER.
Photograph by W. F. Patterson.



BURROWS OF THE GHOST CRAB, HATTERAS INLET.

(*Ocypoda arenaria*), which abounded everywhere, but were particularly numerous near the buried carcasses of some porpoises killed a few days before our arrival. There is nothing in the appearance of these marvelously active crabs to indicate their scavenging habits. When captured for close inspection they were always found to be immaculate. Yet they came from far and near and fairly honey-combed the ground with their burrows in order to avail themselves of the new food supply.

The locality was an ideal one for observing them and Mr. Sanborn was requested to make some camera records while I rounded up the subjects for such poses as were possible. By placing the camera flat on the crest of a narrow sand ridge behind which we were concealed, it was possible to photograph the active excavator of a burrow in the very act of tossing out a load of sand. In digging its burrow, which goes down obliquely two or three feet, the crab makes frequent appearances at the surface with sand—perhaps as much as half a teaspoonful—carried on the folded claws of one side. After an instant's pause with the eyestalks erect, the sand is tossed out with a quick dash—not pushed out, and the crab dives again underground. The work is carried on steadily and in a few minutes the dark-colored damp sand thrown out—always in the same direction—becomes a conspicuous dump heap on the white, dry sand of the beach.

It required patient waiting to catch one outside the entrance in a really good pose.

How those erected eyestalks give the appearance of standing at attention. They are folded down into narrow grooves when he darts into his tunnel. The diameter of the burrow always seems too small for the easy passage of the occupant. The folding up of the great claws and many legs cannot be appreciated until one takes a dead crab in the hands. The way he disposes of them and still

manages to take the burrow on the dead run is admirable.

To surprise a ghost crab on the open beach, head off its wild dash for home and keep up with it on a chase along the hard sand until it could be run down and cornered, meant very lively exercise. Even with the most persistent chasing it seldom attempts to take refuge in the shallow waves washing the beach.



GHOST CRAB ON THE DEFENSIVE.

When utterly tired out and unable to run further, the crab assumes the defensive, with claws raised and eyestalks erect. It strikes furiously at the cap or handkerchief and when the fierce nippers have once made fast, the hold is maintained with tenacity.

The ghost crabs are nearly white in appearance and—for crabs—decidedly ghost-like as they dart about the white beaches in the moonlight.

Another feature of animal life in the Hatteras neighborhood is the Fiddler Crab, (*Uca pugilator*), which swarms everywhere in the salt marsh areas. They are so numerous that it is almost impossible to avoid treading on their burrows. Unlike the ghost crabs of the open sandy sea beaches, the fiddlers are largely vegetarians, forever carrying bits of algæ into their burrows. While the former in excavating, actually *throw* the sand from the entrance, the latter *carry* it out some distance.

How the big "fiddles" of the male are folded down out of the way, when they dash under-



GHOST CRAB CLINGING TO A HANDKERCHIEF.

ground, is even more surprising than in the ghost crabs, so small do the burrows seem when compared with the size of the occupants.

An idea of the abundance of the fiddlers in some places is indicated in the photograph furnished by Mr. Lorillard, which shows many thousands of them driven together in a favorable locality in Florida.

There are few seaside animals of the small sorts about one's feet, which have more lively habits and engaging ways than these

two species of crabs. A single hour's observation of them seldom fails to interest any one whether possessed of natural history inclinations or not. Probably nothing better could be found for a first lesson in natural history for the young.

Labels.—The Aquarium is indebted to the New Jersey State Museum at Trenton for the loan of numerous electrotypes of turtles and frogs to be used in the illustration of new labels now being printed.



GHOST CRAB DIGGING A BURROW.



GHOST CRAB ON THE LOOKOUT.



FIDDLER CRABS ON A FLORIDA BEACH.
Photograph by Pierre Lorillard, Jr.

NOTES.

Horseshoe Crab.—Last summer the Aquarium received a large specimen of the Horseshoe Crab, (*Limulus*), on the back of which were growing a dozen or more good-sized oysters. The specimen is apparently a very old one, with the shell greatly deformed. It had probably lost the power of casting the shell which all crustaceans have, and it may be that very old ones lose the power of shedding altogether, since they are sometimes found with barnacles and ascidians as well as oysters attached to their shells.

Growth of the Sea Horse.—In September the Aquarium received from Atlantic City five specimens of the common sea horse each about two inches in length. Living in the pure sea water now in use, they have grown faster than any

specimens of this species hitherto kept in the building. The temperature of the water has been kept, throughout the winter, at about 72° Fahr., the same as that used for tropical fishes, and all the sea horses now exceed five inches in length. The new sea water system has for nine months given the greatest satisfaction and a larger proportion of marine animals have been carried over the winter than ever before. Under exactly similar conditions the young loggerhead turtles sent by Dr. A. G. Mayer from the Marine Laboratory in Florida in July have more than trebled their size.

Tropical Fishes.—Several species of tropical fishes have for the first time been carried through the winter in good condition and the use of absolutely pure sea water kept at the proper temperature is the secret of success. There has not only been a great saving of specimens but a saving in the cost of operation, as the artificial heating of the reservoir water has cost almost nothing in comparison with the former cost of heating the icy water pumped from the Harbor. The saving in coal has already amounted to several hundred dollars.

The Sunapee or Golden Trout.—In January the Aquarium received from the Sportsman's Show in Boston four specimens of the rare sunapee or golden trout, (*Salvelinus aureolus*), which are still in good condition. These remarkably beautiful fishes are of great interest to anglers. The entire collection of chars.



FIDDLER CRABS IN SHALLOW WATER.



DOLPHIN, (*Delphinus delphis*).
Photograph by L. B. Spencer.

trouts and salmons now in the Aquarium is a remarkably good one. While such fishes are easily kept during the winter, there are usually a number of losses during the summer months when the tanks containing northern fishes have to be cooled by refrigeration. The cold water system now in use has many imperfections and should be replaced with something more modern.

Fish Hatchery.—The Aquarium is at present hatching a consignment of eggs of the silver salmon received from the Pacific Coast in February. The quinnat salmon hatched from eggs received from California last summer are still in splendid condition. Several hundred thousand white-fishes hatched in February have been turned over to the State Fish Commission for planting.

Spiny Lobster.—The very large spiny lobsters received last summer from Bermuda were gradually lost during the winter on account of imperfect shedding. While these animals had no difficulty in casting off the carapace and tail portions they did not seem to be able to free their legs.

While the sea water supply is now very nearly perfect, it is still impossible to furnish all the denizens of the tanks with the foods to which they are accustomed in the tropics, and this difficulty may have had something to do with the loss of the crayfishes.

Box Crabs.—The interesting and oddly-shaped box crabs, (*Calappa flammea*), received from Bermuda last summer have thrived in captivity. These crabs, usually

motionless during the day, are often quite active in the evening. The species differs greatly in appearance from any crab hitherto exhibited at the Aquarium; the first pair of legs are remarkably broad, and when folded, form a shield to the front of the body.

Hawksbill Turtle.—In March the Aquarium received an unusually large and handsome specimen of the hawksbill or tortoise-shell turtle from Bermuda.

Color Changes of Fishes.—In February the Director of the New York Aquarium spent a



HORSESHOE CRAB, WITH LIVING OYSTERS ATTACHED.
Photograph by L. B. Spencer.



LONG-EARED SUNFISH, NEW YORK AQUARIUM.
Flashlight photograph by Lazarnick.

week in Bermuda studying the instantaneous color changes of tropical fishes, an account of which will be published in the forthcoming Report of the New York Zoological Society. He devoted some time to the equipment and methods of the new Bermuda Aquarium, which will be fully described in a work he is preparing on the construction and operation of public aquariums in general. Arrangements were made for the shipment of specimens to the New York Aquarium in June.

The Ocean Sunfish.—Mr. George Pollock, of New York, sent to the Aquarium a photograph of the ocean sunfish or head-fish, (*Mola*), recently taken at Palm Beach, Florida, which is reproduced in this BULLETIN. The specimen weighed only sixty pounds. This strange fish which is an inhabitant of tropical seas, often comes as far north on our coasts as California and Massachusetts. It reaches the enormous weight of eighteen hundred pounds. In appearance it seems to be merely a head with fins; the dorsal and anal are placed well back and the tail is reduced to a mere fringe connecting them.

Attendance.—The attendance at the New York Aquarium for January, February and

March was 519,468, an increase of 59,909 as compared with the same months of last year. An attendance of over half a million in three winter months is remarkable and breaks the Aquarium's own record.

An excellent photograph of one of the dolphins which lived in the Aquarium last summer, appears in this number of the BULLETIN, contributed by Mr. Spencer, who also made the photographs of the large crimson sea anemone, (*Tealia crassicornis*), and the bullfrog.

Mr. N. Lazarnick contributes the attractive flashlight of the long-eared sunfishes, (*Lepomis auroch*).

Leatherback Turtle.—This BULLETIN contains a photograph of the great Leatherback turtle which last summer lived for some weeks



OCEAN SUNFISH, (*Mola mola*), PALM BEACH, FLORIDA.
Photograph by George Pollock.



LEATHERBACK TURTLE, NEW YORK AQUARIUM.
 Photograph by C. H. Townsend.

in the Aquarium. It weighed 840 pounds and was large enough to accommodate the four riders shown in the picture, with perhaps room for another up behind. The specimen has been mounted for the Museum of the Brooklyn Institute of Arts and Sciences and a plaster cast is being prepared for exhibition in the Aquarium. The leatherback is the largest of all existing turtles and this particular specimen is believed to be the largest on exhibition anywhere.

GENERAL INFORMATION.

ADMISSION TO THE PARK.

—On all holidays and on Sunday, Tuesday, Wednesday, Friday, and Saturday, admission to the Zoological Park is free.

On every Monday and Thursday, save when either of these days falls on a holiday, only members of the Society, and persons holding tickets from the Society, are admitted free. All others pay twenty-five cents for each adult, and fifteen cents

for each child under twelve years of age. Tickets are sold only at the entrances.

OPENING AND CLOSING.—

From May 1st to November 1st the entrance-gates will be opened at 9 A. M. and closed half an hour before sunset. From November 1st to May 1st, the gates will open at 10 A. M.

Admission to the Aquarium is confined to members on Monday forenoons. It is open to the public from April 1 to October 31, 9 A. M. to 5 P. M., and from November 1 to March 31, 10 A. M. to 4 P. M. When a holiday occurs on Monday, the forenoon will be available to the public.

Correspondence. — A correspondent from Pennsylvania writes: "Can you tell me where I can get an electric eel to be used for medicine to cure my brother of drinking. It must be put into a vial with the other ingredients until dead, then taken out and the medicine given. I enclose stamped envelope for reply."



LEATHERBACK TURTLE, NEW YORK AQUARIUM.
 Photograph by C. H. Townsend.

ZOOLOGICAL SOCIETY BULLETIN

No. 34

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Prepared by WILLIAM T. HORNADAY, DIRECTOR

A GREAT YEAR FOR GAME PRESERVES.

IN view of the fair certainty that in twenty-five years more, practically all big game will have disappeared everywhere westward of the Mississippi River outside of the rigidly protected areas, the making of state and national game preserves is of paramount importance.

As a duty which it owes to the people of America, and to science, the preservation of wild life is one of the three great objects to which the New York Zoological Society has constantly devoted attention and effort.

The past twelve months have produced grand results in the making of hard-and-fast reserves of great size for the perpetuation of wild life. We wonder whether any other year ever will produce, for Americans, an equal result. The following list shows the most important items, and the date on which the consummation of each was completed:

May 23, 1908. Montana National Bison Range.

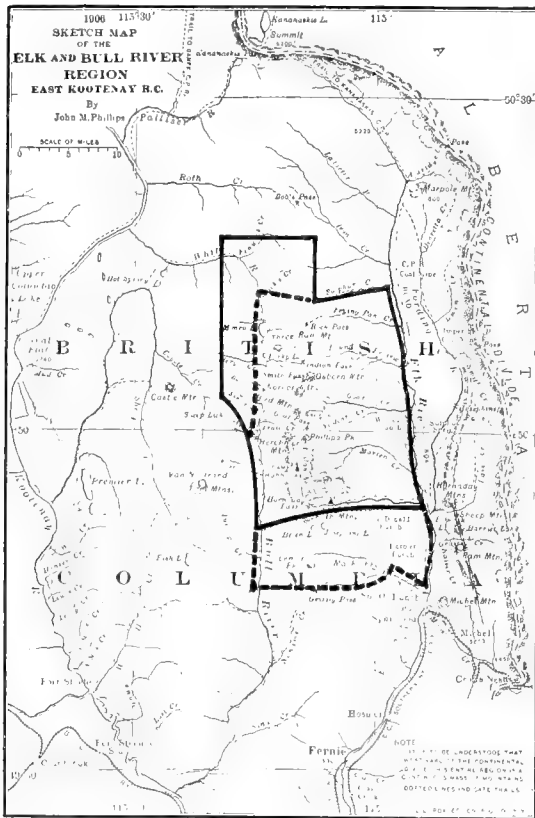
November 15, 1908. Goat Mountain Park, British Columbia.



PHILLIPS PEAK AND GOAT PASS, 11,000 FEET HIGH.
The center of permanent breeding grounds of an abundance of Mountain Goats, Sheep and Grizzly Bears.

Smithsonian Institution
JUN 14 1909

National Museum



BRITISH COLUMBIA'S NEW GAME PRESERVE.
Dotted lines show the original proposition.

March 3, 1909. Mt. Olympus National Monument, Washington.

April 13, 1909. Superior National Forest and Game Preserve.

We may well rejoice over the year's record. The four great sanctuaries named above will greatly promote the permanence on this continent of the moose, wapiti, bison, mountain goat and sheep, grizzly bear, black bear and mule deer. We will briefly summarize the most important facts regarding each of the four new preserves.

THE MONTANA NATIONAL BISON RANGE.

This fenced preserve was established by a special act of Congress, on May 23, 1908, at the solicitation of the American Bison Society. In response to the offer of the Society to present to the government the nucleus herd of bison, Congress has appropriated, in all, \$30,000 for the purchase from the Flathead Indians of twenty-eight square miles of grazing grounds at Ravalli, Montana, and \$13,000 with which to defray the cost of fencing it suitably. In addition to the bison, this fenced range will be stocked as soon as possible with prong-

horned antelope. The success of the bison in self-sustaining herds, on that range, is by no means an experiment. It is a demonstrated certainty.

The Forest Service of the Department of Agriculture is now at work erecting the fence around this great range, and it is hoped that it can be completed by October 1, in order that the Bison Society gift herd of about fifty-four pure-blood bison can then be delivered upon the range, and installed. This range can easily maintain 1,000 bison, and it is fairly certain that many members of the Bison Society will live to see that number of individuals grazing upon it.

The Bison Society has raised \$10,560 in cash with which to purchase about forty-two bison, and fourteen head have been presented to the Society by their owners, for the benefit of the Montana herd.

BRITISH COLUMBIA'S NEW GAME PRESERVE.

On November 15, 1908, the Legislative Council of British Columbia issued a proclamation which converts into an absolute game preserve about 450 square miles of territory between the Elk and Bull Rivers, and around Monro Lake. With a subtraction on the south and an important addition on the northwest, it is otherwise the "Goat Mountain Park" territory, for the preservation of which John M. Phillips and William T. Hornaday for two years or more waged a strenuous campaign of education and appeal. In the final half of the struggle (against active opposition) they were joined by some of the most prominent citizens of Fernie,—Mayor W. W. Tuttle, J. B. Turney and Hon. W. R. Ross, M. P.—and by Warburton Pike, Clive Phillips-Wolley, and other sportsmen and naturalists in Victoria. The Provincial Game Warden, A. Bryan Williams, played a highly important part in the accomplishment of the final result, and it was he who established the boundaries.

The result is a great victory for the mountain goat, mountain sheep, elk, mule deer, and grizzly bear. The area in question is an ideal home for the goat and sheep. Of the former, the new game preserve contains about *one thousand head*, and of the latter at least two hundred, all of them living and breeding there, all the year round. The scenery of the preserve is surpassingly fine, and it is well stocked with many important forms of Rocky Mountain mammals and birds. It was in this region that Professor Henry F. Osborn and Mr. Phillips obtained in 1905 their famous photographs of living mountain goats in their haunts.



MONRO LAKE, IN THE NEW PRESERVE CREATED BY BRITISH COLUMBIA.
This is the center of fine breeding grounds for Elk and Mule Deer.

The making of this preserve is a good object lesson in wild-life preservation. It shows what can be accomplished by two industrious and determined men, particularly when one of them has an official connection with an institution like the New York Zoological Society. This fact is worthy of mention, not by any means as an award of credit to Messrs. Phillips and Hornaday,—for in any event, their part in the matter will be promptly and thoroughly forgotten by the public,—but as an encouragement to other men who might, could, would or should render similar service to the wild-life of America.

A map showing the location of this preserve is given herewith.

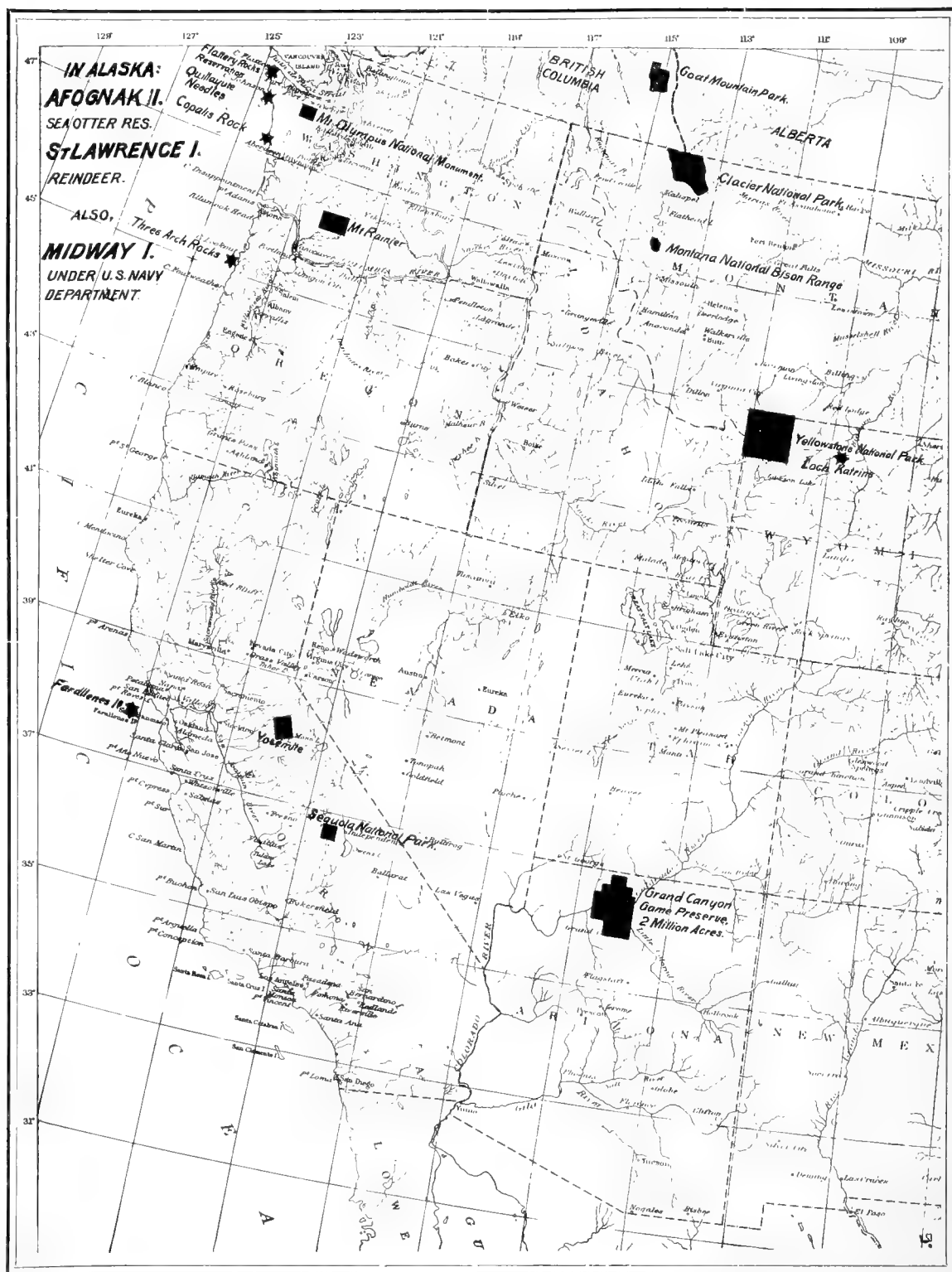
MT. OLYMPUS NATIONAL MONUMENT.

For at least six years the advocates of the preservation of American wild life and forests have desired that the grand mountain territory around Mount Olympus, in northwestern Washington, should be established as a national for-

est and game preserve. In addition to the preservation of the forests, it was greatly desired that the remnant bands of Olympic wapiti (described as *Cervus canadensis roosevelti*) should be perpetuated. In Congress, two determined efforts were made in behalf of the region referred to, but both were defeated by the enemies of forests and wild life.

By a really fine display of forethought and energy in the last days of the last session of Congress, and under the authority of clearly-defined statute laws, the end long desired was accomplished. The Olympic national forest and game preserve—under another name—is now an accomplished fact; and it is both a duty and a pleasure to give Americans an opportunity to award the credit for it to the man who thought it out, and brought it about.—Dr. Theodore S. Palmer, Assistant Chief of the Biological Survey, Department of Agriculture.

In an auspicious moment, Dr. Palmer thought of a law under which it would be both proper



NATIONAL PARKS AND GAME PRESERVES, AND BIRD REFUGES.

and right to bring the desired preserve into existence. The law referred to expressly clothes the President of the United States with power to preserve any monumental feature of nature which it clearly is the duty of the state to preserve for all time from the hands of the spoilers. Already several "national monuments" have been preserved by executive order, of course with the previous concurrence of a number of high departmental officers who by law are empowered to sit in judgment on all such proposals.

With the enthusiastic approval and assistance of Representative William E. Humphrey, of Seattle, Dr. Palmer set in motion the machinery necessary to the carrying of the matter before the President in proper form, and kept it going, with the result that on March 3, President Roosevelt affixed his signature to the document that closed the circuit.

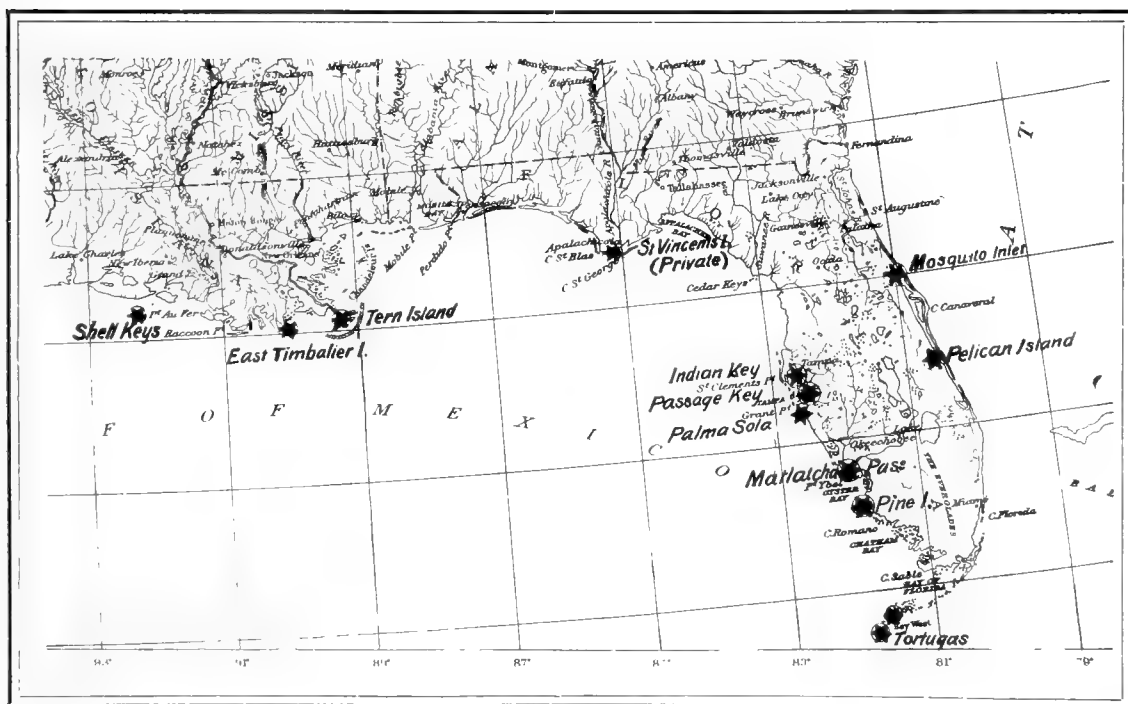
Thus was created the Mount Olympus National Monument, preserving forever 600,000 acres of magnificent mountains, valleys, glaciers, streams and forests, and all the wild creatures living therein and thereon. The people of the state of Washington have good reason to rejoice in the fact that their most highly-prized scenic wonderland, and the last survivors of the wapiti

in that state, are now preserved for all coming time. At the same time, we congratulate Dr. Palmer on the brilliant success of his initiative.

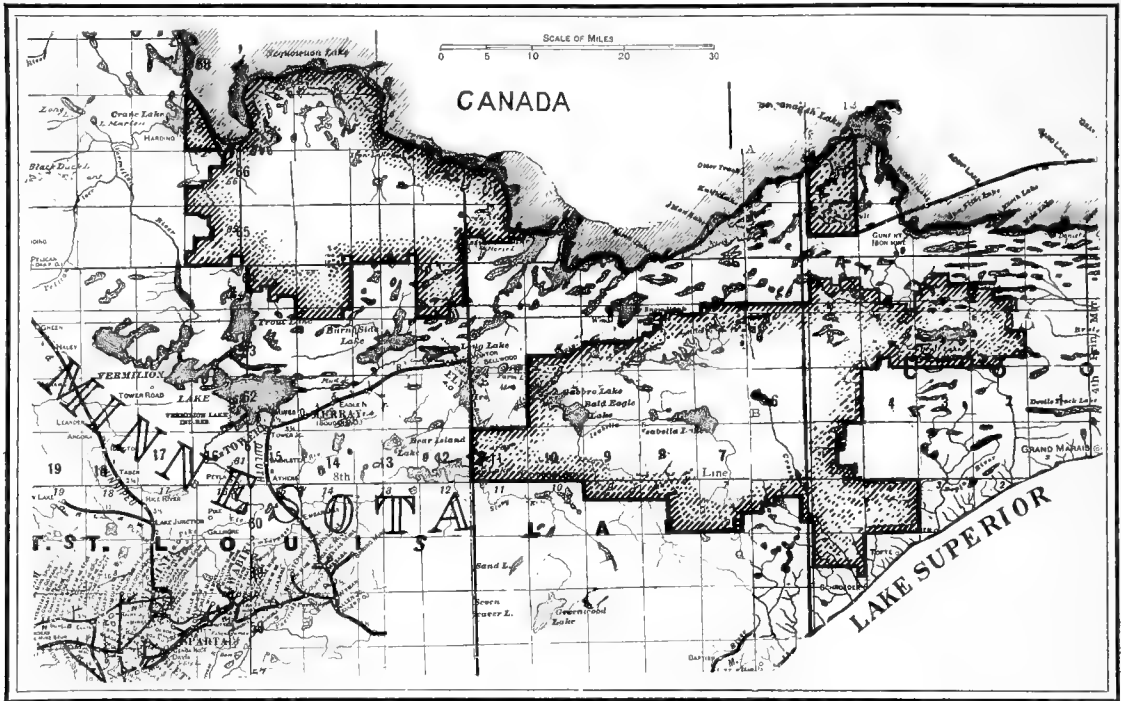
THE SUPERIOR NATIONAL GAME AND FOREST PRESERVE.

The people of Minnesota long have desired that a certain great tract of wilderness in the extreme northern portion of that state, now well stocked with moose and deer, should be established as a game and forest preserve. Unfortunately, however, the national government could go no farther than to withdraw the lands (and waters) from entry, and declare it a forest reserve. At the right moment, some bright genius proposed that the national government should by executive order create a "forest reserve," and then that the legislature of Minnesota should pass an act providing that every national forest of that state should also be regarded as a *state game preserve*!

Both those things were done,—almost as soon as said! Mr. Carlos Avery, the Executive Agent of the Board of Game and Fish Commissioners of Minnesota is entitled to great credit for the action of his state, and we have to thank Mr. Gifford Pinchot and President Roosevelt for the executive action that represented the first half of the effort.



NATIONAL BIRD REFUGES, ESTABLISHED 1903-1908.



SUPERIOR NATIONAL GAME AND FOREST PRESERVE.

The new Superior Preserve is valuable as a game and forest reserve, and nothing else. It is a wilderness of small lakes, marshes, creeks, hummocks of land, scrubby timber, and practically nothing of commercial value. But the wilderness contains many moose, and zoologically, it is to all practical purposes a moose preserve.

In 1908 Mr. Avery saw fifty-one moose in three days, Mr. Fullerton saw 183 in nine days, and Mr. Fullerton estimates the total number of moose in Minnesota as a whole at 10,000 head.

In area it contains nearly 909,743 acres, and its boundaries are shown (for the first time in a periodical) on the accompanying map. The creation of this great preserve was finished on April 13, 1909.

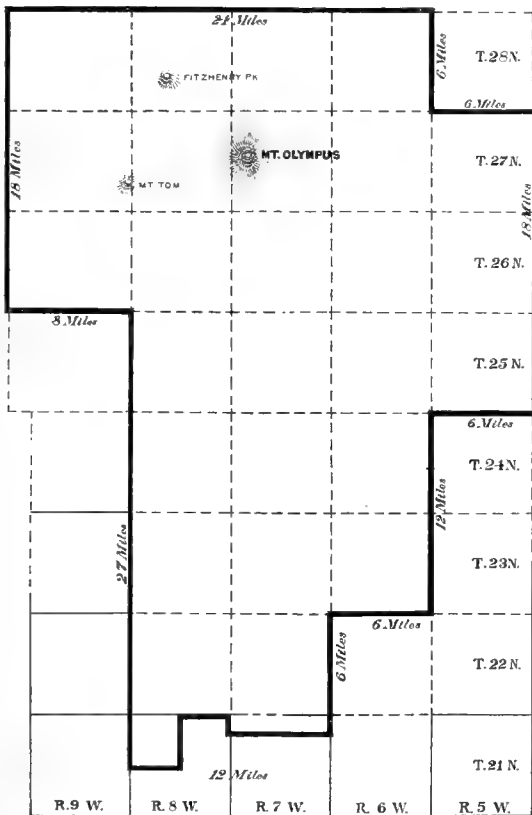
In this connection, it is of interest to notice briefly another national game preserve of recent creation, and to publish a map showing its location.

THE GRAND CANYON NATIONAL GAME PRESERVE.

Even to most persons who are interested in conservation work it will be fresh news that in northern Arizona the Government has established a game and forest preserve equal in scenic

wonders as well as in area to the Yellowstone National Park. It is called the Grand Cañon National Game Preserve, and it consists of the Kaibab Plateau and Buckskin Mountain on the north, the first portion of the cañon of the Colorado, and also a great area southward thereof. It contains, in round numbers, 2,019,000 acres, or 3311 square miles. It includes all of the area formerly comprising the "Grand Cañon National Monument," and fully twice as much more.

The country south of the Colorado Cañon is comparatively well known, but to most Americans the Kaibab Plateau is a veritable terra incognita. It is in that wild and rugged region of broken country, rocks, hills, valleys, brush and a splendid pine-clad mountain plateau looming up over all, that "Buffalo" Jones has located his herd of American bison and "cattaloos," for his latest experiment in breeding a valuable strain of bison blood into range cattle. Fortunately for those interested, there has recently been published about that region a book of thrilling interest. It is Zane Gray's "Last of the Plainsmen," published by the Outing Publishing Company. It is valuable as a general view of a wild and almost unknown region, and



MT. OLYMPUS NATIONAL PRESERVE.

also as a record of the almost incredible exploits of Mr. Jones in catching alive *nine* pumas, by strength of nerve, arm and lasso!

Already the Grand Cañon Preserve contains a few mountain sheep, many mule deer,—and far too many “mountain lions.” Buckskin Mountain and its environs would make a fine sanctuary for elk, but it would be necessary to introduce them. The lower slopes would graze ten thousand bison, but very few persons would ever see them. With the lapse of time—and cattaloes—it will be in order for the National Government to purchase outright the pure-blood bison of Mr. Jones and his partners, and *let them alone where they are, to found another national herd.*

HOPE FOR THE ANTELOPE.

BOTH Montana and Wyoming have recently enacted new laws providing absolute protection for the prong-horned antelope for a series of years. This is a great achievement, for the reason that the chain of protection for that species is now nearly complete. In no

state or territory is it now legal to hunt antelope, at any time; and the penalties for the law-breakers are severe.

It is now in order to work for the enforcement of the antelope laws; and the first thing to do is to reach all ranchmen of antelope countries with a strong appeal to their patriotism and humanity for the creation of a new cowboy sentiment in behalf of antelope preservation.

On January 26 the *Arizona Daily Star* published the news that after an absence of nearly 20 years a band of antelope, containing nearly 50 head, had been seen in Pima County, between the Comobabi and Baboquivari Mountains. This is one of the results of the ten years of close protection that Arizona wisely has accorded her most interesting desert species. All honor to Arizona!

The laws for the antelope are now sufficient. The next thing to provide is for their enforcement. *We must reach the stockmen, and ask them to do that which no one else can do!* If they will say, “Cowboys, there must be *no more* killing of antelope. We wish you to protect them, at all times, and in all possible ways!”—then protected they will be!

There are yet remaining alive probably 5,000 antelope, all told; but we hope that the days of antelope hunting have ended forever. The remnant bands should now be as safe from attack by man as are the animals of a zoological park. The boys of the West should be taught in their schools that it is *a sin* to kill an antelope. Too many thousand square miles of Western plains are now barren and lifeless because the beautiful prong-horn is gone from them. With range cattle and sheep swarming on ten thousand hills, the poor little “saddle” of the prong-horn is no longer needed by anyone as human food.

The antelope is one of our greatest American zoological curiosities,—unique, odd, isolated. It has no *near* relatives anywhere on this earth. Let it alone, and it will take care of itself, and harm nothing. As an ornament to gray and melancholy wastes, as a beautiful wild-life amid barrenness, as the companion of the plainsman, and as the great American oddity, it deserves to live and be let alone.

It is greatly to the national credit that we now are able to publish to the world the news that in every portion of its range throughout the United States the prong-horn is absolutely protected, and for it there is no open season. If we can but maintain this condition, *and stop unlawful killing by the residents of antelope territory*, it may really happen that the Americans of A. D. 1935 will find the antelope still living in our land.

THE FUTURE OF OUR FAUNA.

By MADISON GRANT.

THE growth of sentiment in favor of so-called protection of game has been extremely rapid in the United States in recent years, but unfortunately the destruction of the game in question has proceeded in most cases with even greater celerity. The object of the first game laws was usually the establishment of close seasons, covering for the most part those months during which the young were born and nourished. To these close seasons were soon added restrictions regulating the number of animals to be killed and the mode of hunting, forbidding for example, crusting moose, hounding deer, and the use of swivel guns for ducks. These measures in turn proved inadequate to prevent the rapid diminution of game, so that finally the market itself was attacked, and the trade in skins and meat was either prohibited or strictly limited.

About this time it became evident that some species were either locally exterminated or on the verge of extinction, and there began to appear on the statutes of various states, laws forbidding the killing of certain animals for various periods, usually about five years. Some of these laws were effective where the district in which the prohibition was put into effect adjoined one where game still abounded, and from which a supply could be drawn. Little by little, in this way, the public became accustomed to the fact that in certain places certain animals could not be legally killed at any season, and this naturally led to the next step, viz.—the complete stopping of the killing or capture of all animals in certain restricted localities known as game refuges or sanctuaries. These refuges, the writer believes, are the final solution of game protection. All the other expedients and devices named must prove to be inadequate, except in certain *avored* localities like Long Island for deer, and perhaps Maine and the Maritime Provinces for moose. Sooner or later the development and population of the country at large will reach a point when there will be no room for the larger forms of mammalian life, although there is no reason why game-birds and fish should not continue to abound. These larger forms therefore can only be handed down permanently in refuges like the Yellowstone Park, and these must be established throughout the length and breadth of North America, especially in regions where forest reserves are necessary for the control of the water supply. Whatever hunting the future generations will enjoy must be on the borders of these

reserves, which, if successful, will provide an overflow of game sufficient to stock the surrounding country.

The fact is, that the time is close at hand when we must abridge, or altogether take away the old right to bear firearms and use them on all living creatures. In place of this we must substitute Old World conditions, which appear to be consistent with the preservation of abundant wild-life living on friendly terms with a dense human population, as in India. This is an ideal condition which we Americans must endeavor to establish in this country, if we wish to continue to enjoy the spectacle of animated nature around us. To bring about such a change in public opinion is a gigantic undertaking, and it may be necessary in many places to go through, in our characteristic national way, the process of complete destruction of the animals we have, and the restocking of the country with new and perhaps in many cases with foreign and less attractive forms.

To avoid this last misfortune, the continuation of the native wild stock through the medium of game refuges is absolutely essential. The Adirondacks, for instance, where nearly every native and most of the visitors feel it obligatory to carry around a repeating rifle and to use it on every living thing in season, and on pretty nearly everything except deer out of season, consist now of almost lifeless forests and lakes. If we could once for a definite period of years do away with the habit of rifle carrying, we probably could restore a great deal of the pristine beauty of the North Woods. The natives there have advanced to an imperfect belief in game protection, but still regard "varmint" or vermin as something to be destroyed on all occasions, and used as living targets. The definition of the word vermin most popular in the Adirondacks, seems to be the one recently used in Congress where a western representative stated that, "the term vermin included everything that could not be eaten, differing thus from game, which was edible."

The New York Zoological Society is prepared to continue to support and urge such further restrictive measures as may be from time to time found desirable, but it believes that, looking a generation or two into the future, the only true and permanent solution lies not so much in further legislation, but in a strict and continuous enforcement of existing laws; and most particularly in the creation throughout the country in all desirable spots, especially in mountains and on islands, of sanctuaries for wild-life, where neither rifle, nor fire, nor dog may menace the safety or disturb the breeding

of the wild creatures. Lastly, the Society believes in discouraging and limiting the use of firearms throughout the country at large. The necessity for carrying firearms has now passed away forever. In fact, it has lasted too long in the United States, as a comparative study of the development and civilization of our western states with those of western Canada, will easily demonstrate.

From the day when man became man and walked erect, some four or five hundred thousand years ago, down to our own day and generation, he has been engaged in a ceaseless battle with his fellow inhabitants of the earth. Down to the dawn of the historical period, this battle, waged at first against the sabre-tooth tiger, the cave bear and the hyenadon, was more than doubtful, and only man's co-operation with his fellows, his protection by fire, and his use of dogs as hunting allies, gave him the victory. The struggle continued with renewed violence whenever man entered upon new territory. Century by century his organization became better and his weapons more effective, until during the Neolithic period, his superiority over the brutes became definite. From that period, man's advance to the complete mastery of the globe has advanced by leaps and bounds, and this generation has the unique privilege of standing literally at the close of this long battle, and at the opening of the new period, which is immediately ahead of us, when man will share the earth only with such survivors of the world's fauna as he may choose to tolerate. From present appearances the only exception to this will be insects and rats. On this generation then rests the responsibility of saying what forms of life shall be preserved, in what localities, and on what terms. Let us not delude ourselves for a moment by believing that primitive hunting conditions can ever be restored. The bison and the sheep, the antelope and the wapiti, as game animals have already disappeared or are doomed. So far as wild hunting is concerned, the best that can be hoped for are the highly artificial conditions which prevail on the continent of Europe to-day, and these are not attractive to anyone who has known the free life of the true woodsman. Let us not suppose for a moment that our present game laws, or any improvement or modification of them, can ever permanently provide hunting in the face of the commercial necessities of the future, but let us rather bend our energies to selecting certain portions of our national domain, and establish and strictly maintain sanctuaries for some portion of the wild things that have come down to us from the past.

THE ZOOLOGICAL SOCIETY'S WORK FOR WILD LIFE.

By HENRY FAIRFIELD OSBORN.

THE grand object to which the Zoological Society has chiefly devoted itself during the past ten years, namely a great Zoological Park, depends for the future on the preservation of wild animal life, because, without renewals from the wilderness, our collections will gradually die out and disappear.

In spreading the love of animals we have already made thousands, perhaps millions, of new friends for wild life. Now we propose to unite them all in a great campaign of conservation. This BULLETIN is not our first gun, but it is our first broad-side.

Our work will be mainly directed to the state and public lands of North America, but we shall also co-operate with the great conservation movement in all parts of the world, through a special committee backed by the sentiment and funds from the Society and our future endowments.

Tree preservation in the United States is pressing, but it is less pressing than animal preservation. Trees can be replanted or preserved from seeds, but an animal once gone is lost to the world forever. Nature has been at work millions of years creating some of these exquisite pieces of mechanism and beauty. There is at least a million years' history back of the prong-horned antelope, which is on the danger line to-day. We find its diminutive forbears existing on the plains of South Dakota, before the Rocky Mountains were completely formed, and when fig-trees and the bread-fruit flourished in Montana.

The Virginia deer has even an older known pedigree, two million years back, perhaps. This long and noble ancestry gives fresh force to the appeal for preservation.

Laws enacted in the very best spirit will not absolutely protect. They will help, but in very many of the outlying districts, where the rare game still seeks a refuge, there is no one to enforce the law, and very little sentiment in its favor. Animals are destroyed not for sport but for meat. In the Hell Creek region of Montana, which a few years ago abounded in prong-horned antelope, mountain sheep and black-tailed deer, the destruction has been entirely for meat, and we must admit it is but natural that it is so. The least defensible form of butchery is the extermination of game in the name of sport. The meat-hunter is solitary, he works throughout the year, he knows his distant neighbors will not inform upon him, and that in any case

he will not be punished. This is the actual situation at the very few remaining frontier points, and this is why this Society, while backing up legislation, proposes to put the main brunt of its fight on

ANIMAL REFUGES.

Every territory and every state should have animal refuges for the different kinds of wild life remaining within its borders; and these refuges will soon become the absolute guarantee of the survival of animals like the beautiful prong-horned antelope, which is now on the verge of extinction, and almost certainly the next animal to disappear unless instant measures are taken.

There are two districts in our mind among many others, which are particularly designed by nature as refuges. One is the Hell Creek region itself, untillable, uninhabitable, a chaos of cañons, supporting only a few head of cattle, and that at great risk during every severe season. This is an ideal home for mountain sheep and black-tailed deer, and even for buffalo and prong-horned antelope.

Another preserve region we have visited, is on the head-waters of the Niobrara River or Running Water, in western Nebraska, on the ranch lands of James H. Cook, one of the western pioneers, who is willing and ready to devote his lands and his life to the noble work of conservation. This is an ideal home for the prong-horn and the buffalo, with water, shelter and grass. Prairie, plains and bottomlands combine in the same region—which is also one of the great historic crossing grounds of the migrations of buffalo before the northern and southern herds were divided.

These are two practical examples of the possibilities of the game refuge plan, which our committee will take into consideration. Like all great movements, the first step is the creation of a strong and earnest sentiment, and the establishment of a sound and practical policy. To this sentiment the present BULLETIN is chiefly devoted, and to the exposition of what has and what has not been done.

THE CASE OF DAVID'S DEER.

BUT for the enterprise of His Grace the Duke of Bedford, Père David's Deer, formerly of Manchuria, would now be as extinct as the dodo. The Boxer war destroyed the last known specimens that lived in China, and all those living ten years ago in the zoological gardens of Europe are now dead.

David's Deer is a large and handsome animal, with a long tail, and queer-shaped antlers of

good size. It owes its name to the fact that it was first brought to the attention of zoologists by Father David, a Catholic missionary, in China. Of this species there are living to-day precisely twenty-eight individuals; and all of them are in the matchless collection of hoofed animals owned and maintained by the Duke of Bedford, at Woburn Abbey, England, thirty miles northwest of London. That collection is strictly private, and is to be seen by no one save on the invitation of its owner, and by his co-operation.

Zoologically, as well as otherwise, it is risky and dangerous to preserve in one basket the whole of a lot of particularly valuable eggs. In no form of close captivity could David's Deer be safer, or more immune from epidemic diseases, than in Woburn Park. But, at the same time, the eggs *are* all in one basket. If rinderpest should break out in England, if the foot-and-mouth disease, or the "game disease," or tuberculosis *should* enter Woburn Park (which Heaven forbid!) it might go hard with David's Deer. If Germany *should* invade England—as so many staid Englishmen fear she might or could do,—the herd of David's Deer at Woburn Park might easily be butchered to make a soldier's holiday, as was the herd of 200 in the Imperial Park south of Pekin.

We have respectfully suggested to the Duke of Bedford that it would be a wise and generous act if he were to place an adult male and two females from his herd of David's Deer in some great wilderness preserve, we care not where it might be, to become as wild and mayhap as fruitful as the three English red deer that so wonderously stocked Waipura Island in New Zealand, and *without any deterioration through in-breeding*. Three animals located in the right spot, under intelligent and skilful management in the beginning, might easily rehabilitate the species in a wild state, and restore it to the world's fauna.

Of course no one can say in a moment just where such an effort might best be made. It is certain, however, that four elements are necessary of success: A climate that is not too severe; abundant food and water; a variety of cover, on hills, valleys and plains and probably swampy ground; absolute protection from predatory animals, and from dangerous men, generally.

It is possible that all these conditions could be found in some of the deer forests of Scotland; but it is doubtful whether in all Scotland one could be found in which the David's Deer would not be in great danger of being shot by mistake. I think such an effort should be put forth only in a fenced preserve, of large size, in

which no shooting is ever allowed. The Montana National Bison Range, or the Wichita Bison Range, might answer well; though the climate of the former might prove too rigorous for animals that have been reared in captivity in the milder climate of England. The logical conclusion is the Wichita National Bison Range containing twelve square miles of as fine deer country as any deer ever saw.

LEND A HAND TO GLACIER PARK.

IN the wild and picturesque mountains of northwestern Montana, there is a region that is splendidly provided with rugged peaks, deep valleys, coniferous forests, glistening glaciers, mirror lakes and mountain streams. It is of no direct commercial value to man. The most persistent miners and prospectors have given it up as worthless to them, and it contains no agricultural lands worthy of mention. By reason of the depth of its winter snows, it is wholly unsuitable for grazing purposes.

Indirectly, however, the very snows and streams that now render that region impassable in winter and early spring constitute an asset of real value to the people of this country who live below it. To preserve that value to the utmost, and devote it to the greatest good of the greatest number, there is now before Congress a bill to convert 1300 square miles of that mountain region into a forest reserve to be called Glacier National Park.

The area selected contains sixty glaciers and 250 lakes, and as a source of water supply it is surpassingly fine. Cut off the forests, however, and that region will be a constant menace, and a source of disastrous floods below. Of the desirability of preserving those forests, there can be no question. But how about the game? Senator Carter's bill, which died in the House last winter, did not provide for the wild creatures, probably because he fears that to have it do so would provoke opposition to the bill as a whole. Even the best game-protectors must carefully consider ways and means.

The proposed park contains a fair number of mountain goats and mountain sheep, four members of the deer family—moose, elk, mule-deer and white-tail,—and a few black and grizzly bears. There are six species of grouse, many other birds of exceptional interest, and an abundance of trout of three species.

During the past five months, the columns of *Forest and Stream* have contained three illustrated articles on Glacier Park in which its features and its contents have been set forth with

admirable fullness of detail. The dates of the issues are January 9 and 23, February 20.

We are troubled by the fact that Senator Carter's last bill did not propose to make of Glacier Park *a wild-life preserve*! Evidently the Senator felt that with that feature included, his bill might be defeated. But *will it*? Let us see.

In 1900 the Lacey bill, for the better protection of birds, became a law, by an overwhelming majority,—chiefly because a large number of good citizens wrote to their members of Congress and demanded the passage of that bill without any further postponements or delays. As soon as the members of Congress were definitely assured that "their people" desired the Lacey Bird Law, it went through on a whirlwind of votes.

Now, then, *if the people of the United States desire that Glacier Park be made, and also made as an absolute game preserve, the way in which they can secure that end is by saying so to their members of Congress, next December, when the bill will start anew!*

We believe that the making of the Glacier Park forest and game preserve would be directly in the interest of all the people of the United States; and not only those of to-day, but the generations of the future. There is nothing to be gained by postponing the effort in behalf of the wild life of Glacier Park. If there must be a campaign to secure its protection, by all means let's have it now, and make one job of it! The wild life of that region, game and all, *must be preserved*; and that is all there is in the way of a question about it.

We call upon you, and your newspaper if you have one, to consider this matter, and decide whether or not you, as a broad-minded, patriotic, far-seeing citizen, have a Duty in the matter. If you decide that you have, then write to your Congressman next December, and state your views and your wishes. On all such matters, you will find that the men who compose our Congress and our state legislatures are willing to enact into law *anything reasonable* that the people desire in the line of permanent conservation of our natural resources.

We have no right, either legal or moral, to destroy the wild life now on this earth, or to permit it to be destroyed. We are its guardians and trustees; and the men of the future will hold us accountable for the manner in which we guard their inheritance, and transmit it to them.

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Elwin R. Sanborn, Asst. Editor.

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Permission is given to quote in print any of the matter contained in this issue, with the usual credit to the ZOOLOGICAL SOCIETY BULLETIN. Editors are reminded that *every article that appears in print in behalf of wild-life protection directly aids the general cause.*

WILD-LIFE PROTECTION.

This number of the BULLETIN is wholly devoted to the cause of wild-life protection, because the duties of the hour demand it. One of the three great objects for which this Zoological Society was founded is "the preservation of our native animals." In this field, we began active work in 1897, the second year of our existence. Notwithstanding the great labor that has been involved in the creation of the Zoological Park, —and its practical completion in eleven years,—the Society has constantly engaged in work designed to protect and perpetuate "our native animals." Altogether we have expended about \$6,000 in this line of work.

But the situation has constantly grown more acute, and to-day the need for men to enforce existing game laws is greater than ever before. The Zoological Society is in great need of funds with which to put men in the field, and keep them there actively and aggressively at work. This need emphasizes once more the necessity of raising *immediately* a permanent endowment fund, from the income of which we can pay the cost of wild-life protection work. If some one would place in our hands such a fund as that left by Mr. Wilcox, *i. e.*, \$331,000, for the cause of bird protection, it would go very far toward preserving for future generations of Americans some of the wild species that now are threatened with practical extinction.

THE DUTY OF INSTITUTIONS TO WILD LIFE.

It is an amazing fact that of all the scientific institutions of America two only are actively engaged in the promotion of measures for the preservation and increase of wild life. The exceptions to the rule of absolute passivity are, so far as known, the New York Zoological Society and the American Museum of Natural History.

Of course we speak only to the extent of our knowledge; and if there are other exceptions to be noted, we will welcome them.

The amount of highly specialized "investigation" work that is being done by and through our zoological and educational institutions, is very great; but thus far no man has had the hardihood to speak in print regarding its real and practical value to the world. The amount of abstruse technical scientific publications that annually is turned out in America, is enormous. Our government pays for a quantity of it, and private fortunes meet the bills of the remainder. We do not complain about it; because our withers are unwrung; but the facts are of use here to point a moral.

While all this high-class scientific work has been going on, year after year,—at New York, Washington, Philadelphia, Chicago, Boston, Iowa City and elsewhere,—various bodies of unscientific men and women have been engaged in a constant warfare with wild-life annihilators of a hundred different kinds. Even down to 1896, the scientific ornithologists of America, as a body, had done *absolutely nothing* in the cause of bird protection; and to-day, also, there are many ornithologists who for years have drawn their annual bread and butter from ornithology, who seem to care nothing about our birds save to write papers and books about their dead remains.

With the passage of the Lacey Bird Law,—chiefly through the efforts of G. O. Shields, John F. Lacey, the Audubon Societies and Theodore S. Palmer,—the United States government entered actively into the very necessary practical business of wild-life protection. To-day, the Biological Survey is a great power for good in this direction; and the quicker the game-protection department of it is provided by Congress with more money, the better for us all.

It is quite time that the sportsmen of America should have substantial and continuous help in the warfare they are waging in behalf of wild life. It is time for all the institutions of this country that are in any way interested in zoology to wake up, and take an active part in the warfare that is going on! The amount of accumulated zoological knowledge is now so great that we need fear no fact famine in the near future, not even if every zoologist in America should enlist for ten years of active campaigning in behalf of wild life. If the National Museum, the Smithsonian, the Philadelphia Academy of Sciences, the New York Academy, the Carnegie Institutions of Washington and Pittsburgh, the Museum of Comparative Zoology, the Boston Society of Natural History, the Field Museum and the Chicago Academy of Sciences, were to actively engage in wild-life protection for say, ten years, can anyone doubt the enormous practical benefit that would result?

There are certain duties which civilized men and women can not evade, and be respectable. For zoologists to ignore the slaughter of wild life is wholly wrong; and when we say only that, we put the case very mildly. *It is the bounden duty of the broad-minded and humane men of to-day to take active measures toward securing, for the men of the future, a fair inheritance of the marvellous wild life that still exists on this continent, but which an army of annihilators is trying hard to destroy.*

It is a most singular fact that the true protection of wild life are now, and always have been, the sportsmen and hunters who theoretically should be destroyers, instead of preservers; and it is perhaps more singular still, that those whose whole life's work is devoted to the study of animals are so callous and indifferent to its perpetuation.

Let no closet naturalist believe for one moment that there is no work for him to do, individually. In one hour's time one practical worker in this field can lay out tasks that would keep an army of men busy for a year. Men and money are needed, and the whole North American continent is the battle-ground. The present is no time for timid, half-way measures.

Each institution of those named above should put into the field at least one active and efficient worker, keep him there, and pay the cost of his campaign work. To do any less than this is to fail in a solemn duty.

SUCCESS OF THE BISON SUBSCRIPTION FUND.

Immediately following the passage by Congress in May, 1908, of the bill appropriating \$40,000 for the lands and fencing of the proposed Montana National Bison Range, the president of the Bison Society (W. T. Hornaday), set out to raise \$10,000 by subscription. That fund was necessary to enable the Society to fulfil its pledge to the government that it would furnish the nucleus herd as a gift, as soon as the range was ready to receive it.

It was decided that the subscription should be national in scope; and accordingly the people of every state and territory were invited to participate, in sums from one dollar upward. The call was sent to 150 mayors of cities and forty-eight boards of trade,—but without securing even *one dollar* through any one of them!

In view of the fact that the New York Zoological Society already had presented a herd of bison to the national government, the members of that Society were not called upon to subscribe, save through the membership of a few in other organizations. At the same time, three members of the N. Y. Z. S. generously helped to close the canvass with large subscriptions, to the great relief of the chief canvasser. Mr. Charles E. Senff gave \$1,000, Mr. William P. Clyde \$500, and Mr. Andrew Carnegie \$250.

The campaign for the bison fund lasted nine long months, but finally closed in February, 1909, with a total of \$10,560.50. It contained a number of surprises; chief of which were the following:

The West,—with but slight exceptions,—was remarkably unresponsive, and makes a pitiable showing in the total. The East has cheerfully borne 80 per cent. of the burden.

The women of America subscribed more than one-tenth of the entire sum; and a lady of Massachusetts (Mrs. Ezra R. Thayer, of Boston), raised *one-twentieth* of the whole fund!

The funds now in hand are sufficient to purchase forty-two pure-blood bison, and deliver them upon the range. The government is now acquiring and fencing the twenty-eight square miles of range that were selected by the Bison Society, and it is hoped that the fence will be completed in time that the nucleus herd can be delivered next October.

The Bison Society has been greatly benefitted by the terminal facilities afforded its president in the New York Zoological Park, and desires to record here an expression of its gratitude.

A showing of the entire bison subscription, by states, is as follows:

SUMMARY OF SUBSCRIPTIONS.

| | |
|---------------------------|-------------|
| New York | \$5,213.00 |
| Massachusetts | 2,320.00 |
| Minnesota | 1,054.00 |
| Pennsylvania | 503.00 |
| Montana | 366.00 |
| Illinois | 177.50 |
| District of Columbia..... | 149.00 |
| Connecticut | 97.00 |
| New Jersey | 92.00 |
| California | 91.00 |
| Michigan | 83.00 |
| Ohio | 72.00 |
| Missouri | 53.00 |
| New Hampshire | 53.00 |
| Oklahoma | 48.00 |
| Rhode Island | 39.10 |
| Nebraska | 32.00 |
| England | 25.00 |
| Colorado | 15.00 |
| Arizona | 15.00 |
| Florida | 10.00 |
| Maryland | 8.00 |
| Washington | 7.50 |
| France | 6.90 |
| Iowa | 6.00 |
| Wyoming | 5.00 |
| Kentucky | 4.50 |
| Maine | 4.00 |
| West Virginia | 4.00 |
| "Anonymous" | 3.00 |
| South Carolina | 1.00 |
| Louisiana | 1.00 |
| Vermont | 1.00 |
| British Columbia | 1.00 |
| Total | \$10,560.50 |

EX-PRESIDENT ROOSEVELT'S RECORD IN WILD-LIFE PRESERVATION.

AMONG other things left behind him of which he and his friends may well be proud, ex-President Roosevelt has gone out of office with a most enviable record as a promoter of measures for the protection of wild life. Of course those who knew him best expected much of him, but it is safe to say that even the most hopeful anticipations have been surpassed.

In one short article it is quite impossible to enumerate more than a very few of the measures that should be named in this connection. It is safe to say that during the whole of his six years as president, no measure calculated to benefit the wild life of North America ever was put before him without receiving his instant sympathy and consistent support. He never ignorantly and parsimoniously killed an act for the perpetuation of the bison, nor left the gray squirrel a

prey to gunners because it was too much trouble to sign the bill that had been passed in its behalf,—as did an executive officer of a most important state.

Even the briefest enumeration of the wild-life measures favored and promoted by ex-President Roosevelt must include the following:

The Alaska game laws of 1902 and 1907.

The establishment of the Wichita Game Refuge, Oklahoma, in 1902, and the acceptance of the bison herd in 1907.

The establishment of the Yellowstone Park bison herd in 1902.

The increased attention given the big game in the Yellowstone Park, including the vigorous prosecution of poachers in 1907-08.

The creation of the Grand Cañon game refuge, in Arizona, 1906.

The order prohibiting hunting or trapping of game on the Fort Niobrara Military Reservation, Nebraska, 1908.

The passage of the bill providing for the Montana National Bison Range in 1908, and two supplementary measures in 1909.

The creation of 53 Federal Bird Refuges, 1903-1907.

The creation of the Mt. Olympus National Monument, Washington, 1909.

The creation of the Superior National Forest and Game Preserve, Minnesota, 1909.

The meting of the North American Conservation Commission, and its declaration for game protection, 1909.

Is not this record sufficient of itself to make a reign illustrious? We think it is.

SOME OF THE IMPORTANT THINGS TO BE DONE FOR THE PROTECTION OF WILD LIFE.

CONDEMN as unsportsmanlike and unfair the use of the noiseless gun in killing wild life.

Establish Glacier National Park, as a forest and game preserve.

Establish the Appalachian National Forest Preserve,—saying nothing at present about the game!

Work for the enactment of a perpetual close season on all the antelope, caribou, mountain sheep and mountain goats in the United States, wherever situated.

Encourage Colorado in the creation of a State Game Preserve in Estes Park.

Discourage the use of wild game as necessary food for civilized man.

Discourage the killing of shore birds (Order *Limicolæ*) as "game," and "food" for man.

Discourage the indiscriminate carrying of firearms.

Prohibit in all states and territories the carrying of guns by unnaturalized aliens.

Prohibit, in all states and territories, all Spring shooting; and begin the campaign in Iowa.

Acquire Cat Island, Gulf of Mexico (near Pass Christian, Miss.) as a bird preserve.

Provide for every state and territory a gun license law.

THE RIGHTS OF OWNERS OF ANIMAL PRESERVES.

WE believe that every owner of a private game preserve is entitled to the right to kill the game that he owns and maintains, whenever he pleases, *provided* such killings do not interfere with the execution of laws for the protection of game and other wild life outside of private preserves. We believe that this is not only good law, but also good common sense.

If an owner of a private menagerie of show animals has a right to kill a bad deer during the close season,—which he undoubtedly has,—it is only logical to conclude that the owner of a deer pasture should have the same right. The owner of a game park may kill his dog—if that painful duty seems imperative—but according to the present laws of many states, he has no right to kill one of his own deer, save in the open season for deer.

This situation is absurd, and therefore can not long endure. The raising of deer or pheasants or mallard ducks in fenced enclosures, for the market, should now be placed on the basis of a legitimate industry. There is no good reason why an owner of a deer preserve should not kill one of his deer whenever he chooses, *provided* he does not sell the carcass, or give it away outside his preserve, during the close season; but the *sale* of the flesh in the close season is a different and far more serious matter.

A sensible law covering this point would give much encouragement to the breeding of deer and game birds, and to the establishment of more private game preserves. There are many good reasons for the creation of a new basis for this industry, *provided* it can be accomplished without promoting the illegal killing of wild stock. It is there that the shoe pinches hard.

There is one grave difficulty that must be overcome before it becomes possible to legalize either the killing or the selling of home-grown game during the close season. It is well known

that every unscrupulous game dealer will be quick to take advantage of any relaxation of existing laws to traffic illegally in wild game illegally killed. The only objection to the passage of laws that will be fair and liberal for the preserve owners lies in the overshadowing menace of the game-dealer and lawless consumer.

If any man can propose a system that will permit the preserve owner to kill and market surplus pheasants or deer during the close season, without having the privilege immediately and successfully used as a cloak for the illegal slaughter of wild game, let him bring it forth in his state legislature.

REFUGES FOR BIRDS.

AROUND the coast of the United States, there is gradually being extended a chain of insular bird sanctuaries that means much to the avifauna of North America. Prior to January 1, 1909, twenty-five national bird refuges had been created by executive order and proclamation, chiefly along our sea-coasts. They provide specially protected breeding-grounds for the brown pelican, gulls, terns, skimmers, shore-birds of various species, herons, egrets, ducks and numerous other species. It is impossible to overestimate the zoological value of these sanctuaries, or to praise too highly the wisdom that brought them into existence.

The accompanying map shows all the littoral bird sanctuaries that were created prior to 1909; but during the present year 26 more island preserves have been proclaimed. The list of the federal bird reservations established previous to 1909 is as follows:—

LIST OF FEDERAL BIRD RESERVATIONS.

| | | |
|------------------------|---------------|---------------------|
| Pelican Island, | Florida, | March 14, 1903. |
| Breton Island, | Louisiana, | October 4, 1904. |
| Stump Lake, | North Dakota, | March 9, 1905. |
| Huron Island, | Michigan, | October 10, 1905. |
| Siskiwit Island, | Michigan, | October 10, 1905. |
| Passago Key, | Florida, | October 10, 1905. |
| Indian Key, | Florida, | February 10, 1906. |
| Tern Island, | Louisiana, | August 8, 1907. |
| Shell Key, | Louisiana, | August 17, 1907. |
| Three-Arch Rocks, | Oregon, | October 14, 1907. |
| Flattery Rocks, | Washington, | October 23, 1907. |
| Quillayute Needles, | Washington, | October 23, 1907. |
| East Timbalier Island, | Louisiana, | December 7, 1907. |
| Copalis Rock, | Washington, | October 23, 1907. |
| Mosquito Inlet, | Florida, | February 24, 1908. |
| Tortugas Keys, | Florida, | April 6, 1908. |
| Klamath Lake, | Ohio, | August 8, 1908. |
| Key West, | Florida, | August 8, 1908. |
| Lake Malheur, | Ohio, | August 18, 1908. |
| Chase Lake, | North Dakota, | August 28, 1908. |
| Pine Island, | Florida, | September 15, 1908. |
| Matlacha Pass, | Florida, | September 26, 1908. |
| Palma Sola, | Florida, | September 26, 1908. |
| Island Bay, | Florida, | October 23, 1908. |
| Loch Katrine, | Wyoming, | October 26, 1908. |

A SPORTSMAN'S PLATFORM.

FIFTEEN CARDINAL PRINCIPLES AFFECTING WILD GAME AND ITS PURSUIT.

Proposed by William T. Hornaday, April 17, 1908.

1. The wild animal life of to-day is not ours, to do with as we please. The original stock is given to us *in trust*, for the benefit both of the present and the future. We must render an accounting of this trust to those who come after us.

2. Judging from the rate at which the wild creatures of North America are now being destroyed, fifty years hence there will be no large game left in the United States nor in Canada outside of rigidly protected game preserves. It is therefore the duty of every good citizen to promote the protection of forests and wild life, and the creation of game preserves, while a supply of game remains. Every man who finds pleasure in hunting or fishing should be willing to spend both time and money in active work for the protection of forests, fish and game.

3. The sale of game is incompatible with the perpetual preservation of a proper stock of game; therefore it should be prohibited, by laws and by public sentiment.

4. In the settled and civilized regions of North America, there is no real *necessity* for the consumption of wild game as human food; nor is there any good excuse for the sale of game for food purposes. The maintenance of hired laborers on wild game should be prohibited, everywhere, under severe penalties.

5. An Indian has no more right to kill wild game, or to subsist upon it all the year round, than any white man in the same locality. The Indian has no inherent or God-given ownership of the game of North America, any more than of its mineral resources; and he should be governed by the same game laws as white men.

6. No man can be a good citizen and also be a slaughterer of game or fishes beyond the narrow limits compatible with high-class sportsmanship.

7. A game-butcher or a market-hunter is an undesirable citizen, and should be treated as such.

8. The highest purpose which the killing of wild game and game fishes can hereafter be made to serve is in furnishing objects to overworked men for tramping and camping trips in the wilds; and the value of wild game as human food should no longer be regarded as an important factor in its pursuit.

9. If rightly conserved, wild game constitutes a valuable asset to any country which possesses it; and it is good statesmanship to protect it.

10. An ideal hunting trip consists of a good comrade, fine country, and a *very few* trophies per hunter.

11. In an ideal hunting trip, the death of the game is only an incident; and by no means is it really necessary to a successful outing.

12. The best hunter is the man who finds the most game, kills the least, and leaves behind him no wounded animals.

13. The killing of an animal means the end of its most interesting period. When the country is fine, pursuit is more interesting than possession.

14. The killing of a female hoofed animal, save for special preservation, is to be regarded as incompatible with the highest sportsmanship; and it should everywhere be prohibited by stringent laws.

15. A particularly fine photograph of a large wild animal in its haunts is entitled to more credit than the dead trophy of a similar animal. An animal that has been photographed never should be killed, unless previously wounded in the chase.

REMARKS ON THE SPORTSMAN'S PLATFORM.

Up to this time it appears that no declaration of principles ever has been submitted to the sportsmen of the world, or even to those of America alone, for their endorsement and adherence. Because of this fact, and in the hope of a result useful to all, I have the honor to submit the enclosed Sportsman's Platform, for such endorsement as it may be able to win on its own merits.

It is my belief that much strength may be gained for the general cause of game protection by a definite agreement between the sportsmen of the world on the cardinal principles that apply everywhere to the pursuit and the preservation of large game. Such an agreement would be received in all law-making bodies with respectful consideration, and if sufficiently comprehensive it might prove of great value in campaigns for better game laws, for the education of the general public, and for the creation of new game preserves.

These fifteen cardinal principles have been drawn up to cover not only the conditions that exist to-day, but also to meet others that seem of certain development in the near future. For the countries of Asia and Africa it is easy to substitute for "Indian" the word "native."

The adoption of this Platform by sportsmen's organizations, and by unattached sportsmen, is respectfully invited; and a careful register will be kept of all who advise me of their endorsement.

W. T. H.

ADOPTIONS.

The following organizations have formally adopted the Sportsman's Platform as their code of ethics, and published it in their club books:—

CAMP-FIRE CLUB OF AMERICA, New York, Dec. 10, 1908. Ernest T. Seton, President. Membership, 260.

THE LEWIS AND CLARK CLUB, Pittsburg, Pa. William M. Kennedy, President. Sixty members.

THE NORTH AMERICAN FISH AND GAME PROTECTIVE ASSOCIATION, January 20, 1909. Hon. Dr. J. O. REAUME, President. Membership about 400. An international organization. Adopted at the Toronto Convention, after a full discussion of Plank 5.

THE ROD AND GUN CLUB, Sheridan County, Wyoming, May 1, 1909. George Lord, President; Dr. F. A. Hodson, Vice-President. Seventy-four members.

THE CAMP-FIRE CLUB OF MICHIGAN, Detroit, May 20, 1909. Gustavus D. Pope, President. Organized May 12. Twenty members.

CONVICTION OF SONG-BIRD KILLERS.

VINCENZO SACCO and Antonio Guadagno, who were arrested by Deputy Game-Warden John J. Rose, of the Zoological Park force, for killing song-birds for food, as described in BULLETIN No. 32, page 473, were finally tried and convicted, and sentenced to ten weeks in the penitentiary. If the fines to which the men were liable had been paid, according to law, they would have amounted to about \$450. The offenses referred to were committed in New York City, within three miles of the Zoological Park.

MISS CAROLINE PHELPS STOKES.

THE wild birds of America have lost a good friend. On April 26, 1909, Miss Caroline Phelps Stokes passed from earth.

It is fitting that all friends of birds, and of wild life generally, should know that only a few months before her death, Miss Stokes completed the establishment with the New York Zoological Society of a special endowment fund of \$5,000, the income from which is to be expended annually in measures designed to promote the protection and increase of our native birds. So far

as we are aware, this is the second bequest of the kind ever made in this country, and the Society will scrupulously carry out the wishes of the lamented founder of the fund.

NATIONAL AND PROVINCIAL PARKS AND GAME PRESERVES.

June 1, 1909.

IN THE UNITED STATES.

| | Area. |
|---|------------------|
| Yellowstone National Park, Wyoming..... | 2,142,720 acres. |
| Chickamauga and Chattanooga National and Military, Tennessee..... | 6,195 " |
| Sequoia, California..... | 160,000 " |
| Yosemite, California..... | 967,680 " |
| Mt. Rainier, Washington..... | 207,360 " |
| Crater Lake, Oregon..... | 159,360 " |
| Game Cañon Game Preserve..... | 2,019,000 " |
| Mt. Olympus National Monument..... | 600,000 " |
| Superior Game and Forest Preserve..... | 909,743 " |
| Wichita Forest and Game Preserve..... | 57,120 " |
| Wichita National Bison Range..... | 9,760 " |
| Montana National Bison Range, fenced range, for captive game herds..... | 20,000 " |

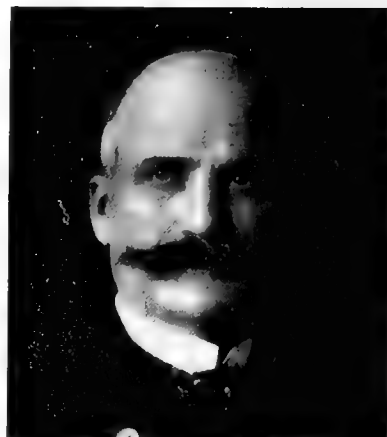
IN THE CANADIAN ROCKIES.

| | |
|---|------------------|
| Rocky Mountains Park, Alberta..... | 2,764,800 acres. |
| Yoho Park, Alberta..... | 1,799,680 " |
| Glacier Park, Alberta..... | 1,474,560 " |
| Buffalo Park, Alberta (for captive bison)..... | 384,000 " |
| Elk Island Park, Alberta, (for captive bison)..... | 40,960 " |
| Jasper Park, Alberta..... | 3,488,000 " |
| East Kootenay Preserve, British Columbia..... | 288,000 " |
| ("Goat Mountain Park.") | |
| Yalakom Mountains, Lillooet District, British Columbia..... | 192,000 " |



WILLIAM DUTCHER.

THREE
GREAT CHAMPIONS
OF WILD
LIFE.



GEORGE O. SHIELDS.

THERE are three men who will be remembered gratefully by millions of Americans for a century after the ephemeral celebrities of to-day have been forgotten en masse. It is well that these men should be fully known and appreciated while they are alive.

DR. THEODORE S. PALMER, Assistant Chief of the Biological Survey of the Department of Agriculture, is always to be found where the fight is fiercest. He is an expert on game laws, a shrewd and careful manager, a trained diplomat, and also a resourceful fighter. Whenever state workers get into a fierce campaign, Dr. Palmer is appealed to for aid. He has appeared in the legislatures of perhaps twenty different states, and helped to win many a campaign for wild life.

It was he who relentlessly and tirelessly pursued the infamous Binkley and Purdy gang of poachers in the Yellowstone Park, and with the vigorous backing of the Department of Justice dealt the poachers a crushing blow. The four poachers who once were so bold and defiant were utterly ruined, one being to-day in the penitentiary, and the other three fugitives from justice. This victory was of far-reaching importance.

Besides his active campaigning for good laws, and against bad ones, Dr. Palmer is the Government's expert on the making of reserves for big game, and island refuges for birds. The new Mt. Olympus game and forest reserve in Washington is his latest and most important achievements, and in every sense it is a monument to him, none too great to stand as a perpetual memorial of the man and his work.

MR. WILLIAM DUTCHER, of New York, President and general manager of the National Audubon Society, deserves all the honor the lovers of birds, and the recipients of their beneficial services, ever could bestow upon one individual. His career began in 1898, as chairman of the A. O. U. Committee on Bird Protection. His special work has been the protection of song-birds, the gulls and terns of the seashore, the "plume birds" and insectivorous birds, generally.

Inspired by Mr. Dutcher's zeal and work, the late Mr. Albert Wilcox bequeathed his entire fortune, of \$331,000, to Mr. Dutcher's National Association, for bird protection work, and in 1906 it became available. The impetus which the income of this fund has given

to systematic work in behalf of birds has been very great. Mr. Dutcher now is enabled to keep constantly in the field five splendid workers, where their services are most needed, and pay all their expenses. Fortunately, Mr. Dutcher's private business is on a basis so thoroughly automatic that he is enabled to devote a great deal of his time to managing campaigns in behalf of birds. The Francis bill recently pending at Albany against "the white badge of cruelty" was his measure, and as usual the alien milliners were solidly arrayed against him, on the plea that his bill would hurt their business!

The farmers of America little realize what they owe to William Dutcher. Perhaps eighty per cent. of them have not yet heard of him; but with them all his name should be a household word.

MR. GEORGE O. SHIELDS, formerly editor of *Recreation*, now editor of *Shields' Magazine*, founder and for ten years president of the League of American Sportsmen, bears a name that for many years has been a symbol of terror to "game-hogs," and the exterminators of wild life. He did not hesitate to use drastic methods in influencing the men who shoot and fish not wisely but too well, whenever their skins proved impenetrable to appeals to reason and decency. By the game-hog element, Mr. Shields has been both feared and hated; but his influence in behalf of wild life has covered practically the whole United States, and has been of enormous value to that cause. He has played an important part in securing new legislation, but also in enforcing protective laws.

For years this veteran game protector has battled early and late, in season and out, tirelessly, and at times even recklessly, so far as his own fortunes were concerned, to stop the slaughter of wild creatures, and reform the inconsiderate and wanton game killers. The work he did, and still is doing, will live and be remembered by his countrymen long after his active labors are done.

During the past four months Mr. Shields has made a tour across the continent, in which he delivered seventy-four lectures and over 200 addresses to schools, each one of which was a powerful appeal in behalf of wild life. The tour was practically a continuous ovation, and its influence upon the public will be not only great, but continuous.

THE REAL EXTERMINATORS OF BIG GAME.

BEFORE the International Conservation Conference held in Washington, in an address in behalf of wild life, the Directors of the Zoological Park declared in strong terms that the men who live in or near to the haunts of big game are the real exterminators of our finest wild animals. At this moment, a very aggravating case in point is reported from Fremont County, Idaho, on the western side of the Yellowstone Park.

During the awful weather of the past winter, about 500 elk fled to Fremont County, seeking feeding-grounds by which to survive until spring. *Practically all of them were slaughtered by the people living there!* And this was done, not only in defiance of the dictates of mercy and humanity, but also in defiance of statute law. At the time that slaughter was proceeding, the people of Jackson's Hole (Wyoming), and the state of Wyoming, were spending nearly \$7,000 in the purchase of hay, and in feeding the elk of Jackson's Hole to keep them from starving en masse.

The following from the Boise (Idaho) *Statesman*, of February 25th, and quoted in *Outdoor Life Magazine*, is of general interest:—

"E. W. Yoemans has returned from a trip into Fremont County that took him into the Teton Basin country and to the borders of Jackson's Hole.

"The slaughter of elk in that section is something appalling," he said. The snow is deep and the animals are driven down toward the settlements. They are helpless and can be picked off with ease. Farmers, not hunters, are the guilty parties.

"One man told me he knew a farmer who had killed six of the noble animals. He said he would have complained if the man had not been his neighbor. A mail-carrier informed me he saw forty-two elk struggling through the snow in single file. Two of the animals had been severely wounded and were bleeding and staggering. As the animals approach farmhouses they are mowed down. Elk meat, heads and hides are on sale in suspicious quantities.

"The game law prohibits the killing of more than one elk in a season. The conditions in Fremont County have caused the game warden to be severely criticised. It is stated that no trouble would be experienced in securing evidence. So far not an arrest has been made. Mr. Yoe-

mans brought back with him a copy of the *Ash-ton Enterprise* of February 11th, from which the following is taken:

"Word reached here Wednesday that the day before six elk had been killed at Squirrel. To-day a rancher brings word to town that nine elk cows and calves crossed his place this week and before they had proceeded three miles all but one had been killed. Elk meat was also offered for sale in town to-day, Thursday."

A GAME-LAW "ACCIDENT" IN WYOMING.

HERETOFORE, whenever a joker has been found stowed away in a new game-law, it has always operated against some wild game species, contrary to the intentions of the majority. For example, in 1907, a clause slipped through the Montana legislature removing all protection from the beaver; which was quickly noted, and made much of by trappers who gladly would trap and kill the last beaver, if they could.

But this year, the case is reversed. When the Wyoming legislature very laudably passed a law permanently protecting the prong-horned antelope, and it had been duly engrossed and signed by the governor, a legal stowaway was discovered in its midst. To the horror of the elk hunters, it was found that both the elk and mountain sheep had been named as species for which there should be no open season! And this with thousands of otherwise killable elk around the Yellowstone Park! No wonder Jackson's Hole has put on mourning.

The inclusion of the elk was of course unnecessary, and also decidedly unfortunate. With 30,000 elk in Wyoming, there is no need for a perpetual close season; and there is no need to break up the legitimate business of guiding law-abiding elk hunters. In feeding 20,000 starving elk last winter, the people of Jackson's Hole have done well; and this we must not forget.

As for that mountain-sheep clause, however, we rejoice with exceedingly great joy! *The sheep of Wyoming, Montana, Idaho and Colorado must have absolute and permanent protection, or they are doomed to quick extinction!* It has not come one moment too soon; and the people of Wyoming should hold that law on the sheep just where it is, *forever*.



THE WICHITA NATIONAL BISON HERD ON ITS RANGE.



GENERAL VIEW OF THE MONTANA NATIONAL BISON RANGE, FROM THE EAST.

Proposed Buffalo Range from the direction of Mission Mountains. The highest point is Quilseeh, 4,800 feet. To the left is Wheewheetchaye,—Red Man's Ridge.

THE WILD ANIMALS OF
HUDSON'S DAY
AND THE
ZOOLOGICAL PARK OF
OUR DAY

BY WILLIAM T. HORNADAY, Sc. D.



PUBLISHED BY THE
HUDSON-FULTON COMMISSION
IN COOPERATION WITH THE
NEW YORK ZOOLOGICAL SOCIETY

THE HUDSON-FULTON CELEBRATION COMMISSION

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SPECIAL NOTICE

DURING THE HUDSON-FULTON CELEBRATION the most important species of Mammals, Birds and Reptiles of the ZOOLOGICAL PARK that inhabited New York State in Hudson's day, will be marked by the official flag of the Commission.

THIS SPECIAL BULLETIN appears in the interests of the Celebration. Editors of newspapers hereby are given permission to copy from it, for use in newspapers, any of the matter contained herein save the illustrations that are reproduced by permission of Charles Scribner's Sons, from the "American Natural History."

COPIES OF THIS BULLETIN may be obtained by mail, at 25c. each, postpaid, by remitting to H. R. Mitchell, Chief Clerk, New York Zoological Park. As long as the supply lasts, it will be on sale at the Zoological Park entrances, and elsewhere in New York City.

HUDSON-FULTON CELEBRATION NUMBER

ZOOLOGICAL SOCIETY BULLETIN

PUBLISHED BY THE HUDSON-FULTON CELEBRATION COMMISSION,

IN COOPERATION WITH

No. 35

THE NEW YORK ZOOLOGICAL SOCIETY.

September, 1909

THE WILD ANIMALS OF HUDSON'S DAY.

By WILLIAM T. HORNADAY,

DIRECTOR OF THE NEW YORK ZOOLOGICAL PARK.

PART I.—THE BIRDS.*

ONLY the bold adventurer who has sailed a frail bark westward across three thousand miles of stormy ocean can know the thrill that is transmitted by the heliograph flash of a pair of silvery wings, with the knowledge that land is near. To the westward trans-Atlantic voyager, it is always the **Herring Gull** that far at sea proclaims the land.

On the wing, this Gull is always beautiful; but never is its plumage quite so silvery, and never are its flight-curves so graceful, as when it greets the tired American who thankfully is sailing toward the Statue of Liberty and Home.

Other birds sometimes met off shore, are the deep-water ducks, particularly the **Red-Breasted Merganser**, with a bill like the serrated snout of a Gangetic crocodile, and flesh so frankly and rankly fishy that only the most powerful human palate can accept it. The **Scoters**, or **Surf Ducks**, once in evidence at sea, now are rarely seen in the waters adjacent to New York.

Three hundred years ago, before the dark days of bird slaughter in America, it is reasonably certain that New York Bay attracted immense flocks of web-footed wild-fowl. If the histories of that period do not so record it, then the historians were remiss. We are certain that once inside Sandy Hook, the all-too-succulent **Canvasback Duck**, and its understudy, the **Redhead**, "might have been seen," and in fact were seen, by the discerning mariner. But in

an evil moment the baneful eye of the epicure fell upon the savory Canvasback, and he pronounced it the king of table ducks. From that hour, its doom was sealed; and today it is almost a bird of history.

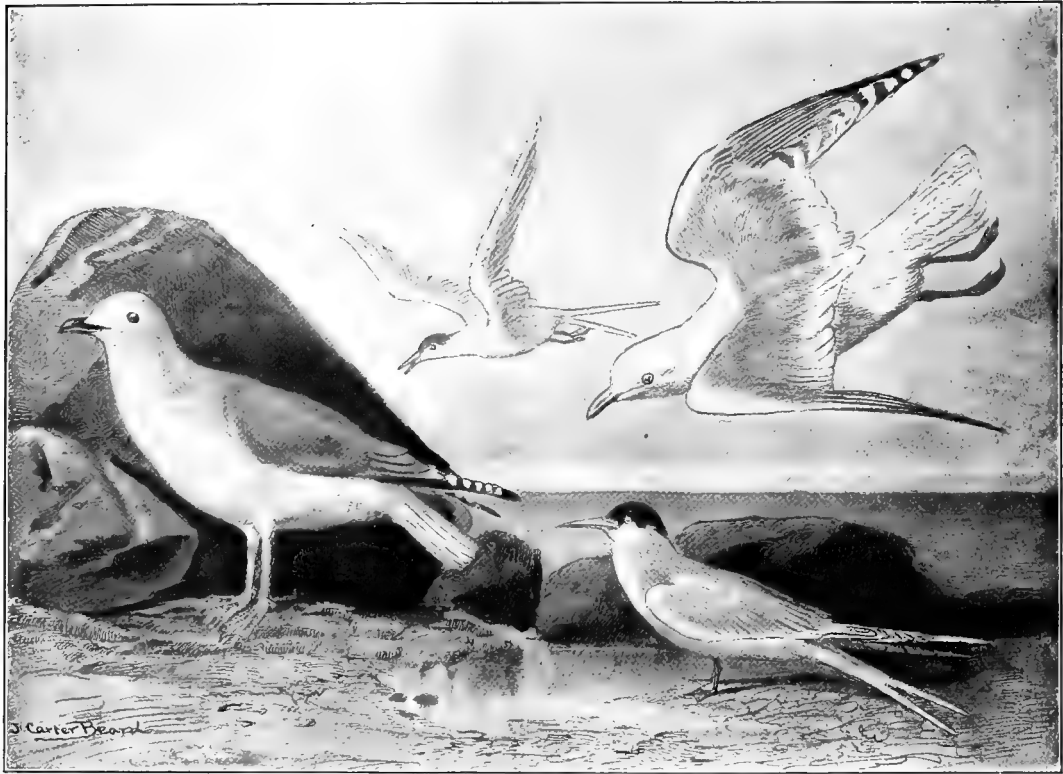
Let us for the moment try to put ourselves in Explorer Hudson's place, and see the birds of the Hudson River and Valley, as he and his men saw them.

Surely on the ponds and streams of Manhattan Island they found the exquisite **Wood Duck**; for even today an occasional wanderer returns to its old haunts in the Zoological Park! Stated in the form of a proportion, the Wood Duck is to Other Ducks as The Opal is to Other Gems,—the most glorious in colors of them all. The **Pintail Duck**, however, is more beautiful in form. The most graceful yacht that ever floated never was half so exquisitely modeled in hull and stern and bow as this web-footed water fairy.

The **Mallard Duck** is like charity. It suffereth long, and is kind; so it holds on long after the more sensitive species have been shot out. It will be our last good wild duck to be exterminated by the pot-hunters for the starving millions of wealth,—for whom the fashionable chef feels that he *MUST* provide game, or be disgraced. In the years that have flown, the quiet bayous of the eastern shore of the Hudson have fed and sheltered untold thousands of lusty "Green-Heads," young and old, and they were the lawful prey of the hungry explorer and pioneer.

A hundred years ago, the **Osprey**, or **Fish-Hawk**, bred numerous on the rocky walls of

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THE HERRING GULL (1, 2) AND COMMON TERN (3, 4).

the Palisades, and then as now paid toll to the Lord of the Air, who also nested there. Even today they are abundant along the Shrewsbury River, south of New York Bay; but the bay itself no longer furnishes good fishing-ground for them.

The Osprey, or Fish-Hawk, is a bird of highly interesting personality. In the first place, it represents a special development for fishing, and in structure it is a sort of connecting link between the Owls and the Falcons. It has legs that are long and muscular, powerful talons, and unusual wing-power. It thinks nothing of dropping a hundred feet straight into ice-cold water, seizing a fish nearly half its own weight, and flying five miles with it. It is doubtful whether any other bird can catch and bear away fish so large in proportion to its own size. I have seen Ospreys flying with fish so large—always carried with the head pointing forward—that the flight of so small a bird with so great a load seemed almost incredible. It is no wonder that a two-pound fish slowly sailing through the air with an Osprey perched upon it offers a temptation so great that an Eagle cannot always resist it; for, like some human beings, the

one thing that an Eagle cannot resist is temptation.

The nesting habits of the Osprey are extremely interesting. When not disturbed, the bird uses the same nest, year after year, but each year adds substantially to the structure. The sticks used are large, and the nest soon reaches a breadth and height out of all proportion to the size of the builder. On Gardiner's Island, at the eastern end of Long Island, the protection afforded the Ospreys nesting there soon rendered the birds so tame and trustful that they nested very low down, and finally *upon the ground*. Some of the continuous-performance nests constructed on that island are of enormous proportions.

Attempts have been made to colonize Ospreys in the New York Zoological Park, but the birds always flew away and failed to return.

The **White-Headed Eagle**, or **Bald Eagle**, still inhabits the Palisades, and may be seen soaring high above the valley of the Hudson.

When you observe a very large dark-colored bird of prey traveling far aloft, with slow and stately sweep of wings that are broad and short and non-vulturine, it is fair to call it an Eagle. If the head and tail have a gleam like frosted



THE CANVAS-BACK DUCK.

silver, then may you know of a verity that the aerial voyager is our national bird in adult plumage. Incidentally, you may also know that it is one of the handsomest of all living birds of prey.

It is now fashionable for young ornithologists to deride our national bird, and besmirch his character, because he exacts tribute of his vassal, the Osprey. But he needs no defense from me, any more than the fires of Vesuvius need a janitor to hold an umbrella over them to keep out the summer rain. Whenever the great American Eagle really needs defenders, three million lusty Americans will rush to volunteer for the campaign.

I think it is true of every continent that the first birds seen by its explorers,—who almost invariably make their initial entries by the water routes.—are the web-footed birds of sea and

shore, and the feathered fishers of the river-banks and lakes. We can safely predicate that when Hudson first went ashore from the bosom of his mighty river, he became personally acquainted with the **Belted Kingfisher**,—he of the stem-winding voice, the white collar, and the jaunty cap of blue. It has been gravely stated in print that “Kingfishers are found near streams,” and in similar environments may be seen the slow rise and stately flight of the **Great Blue Heron**; but it is on the marshes that we hear the deep-seated “voice” of the **American Bittern**. The traditional “boom” of the Bittern looks good on paper; but when it is compared with the real booms of life, it seems very small. Being most happily unfit for food and uncursed with desirable “plumes,” the Heron and the Bittern, even though large, still are in our midst; but now there are for-



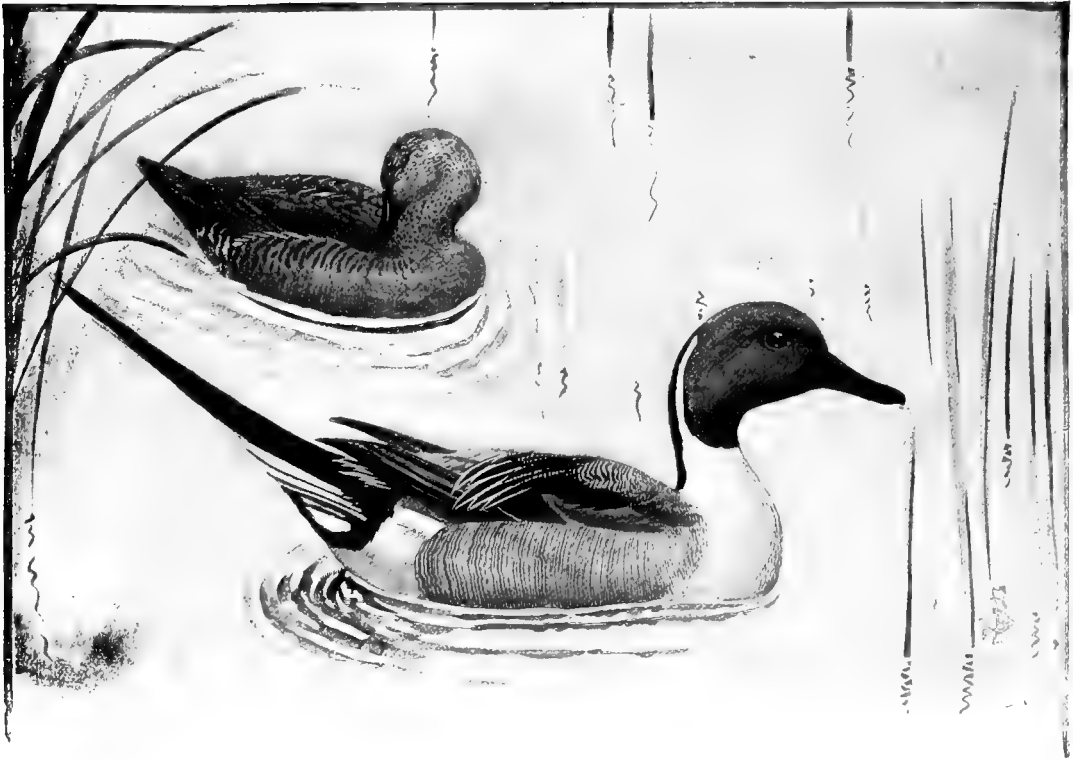
WOOD DUCK.
Male and Female.



THE REDHEAD DUCK.

eign bird-killers to reckon with, who kill and eat everything wild, from vireos to vultures.

Even yet in spring and fall the weird cry of the uncanny **Loon**, or **Great Northern Diver**, is heard occasionally over the upper waters of the Hudson River. In the early days, this bird was a frequent visitor to the Hudson valley, and often nested along the upper waters of the river. Both in form and in habits the Loon is the most remarkable and picturesque feathered inhabitant of the Empire State. It is so much like the giant Penguins of the antarctic regions that it seems as if it once had lived there, but having



THE PINTAIL DUCK.

wings for flight had wisely transplanted itself to God's country.

Fortunately for the **Great Blue Heron**,—by millions of people miscalled the **Blue "Crane,"**—the cruel and insatiate goddess of Fashion has *not yet* decreed that Woman, the merciful and compassionate, shall collect its plumes for her personal adornment. The well-defined fishy flavor of the Heron's flesh protects it from the evil eye of the epicure; and therefore do we still possess this odd and picturesque bird. True, there is today but one Great Blue Heron where a hundred years ago there were a hundred; but we are thankful that the ruthless savages of civilization have spared us even a few samples of the original stock. And yet, there are today State Game Commissioners who are being importuned to "kill off the Blue Herons,"—because in a whole summer season half a dozen of them will kill and eat as many fish as one greedy fisherman would catch and send to market in two days!

If there is anything in game-protection that is supremely annoying, it is solemn talk about the "great destruction of fish" by herons, kingfishers, ospreys, and Californian sea-lions.

In many of the coves and alcoves of the low, wet lands flanking the mighty Hudson stream, the **Woodcock** and the **Wilson Snipe** still are found; but they are now so rare throughout the Hudson valley that few gunners find it worth while to hunt them. It is the same old story,—of inordinate and persistent destruction, down to the vanishing point. Throughout New York state, and many other states, also, both these species should be accorded absolute all-the-year-round protection for at least ten years. It is either that or extinction; and which will the people choose?

Thanks to the splendid efforts of the bird lovers of New York state, headed by the Audubon Society and William Dutcher, the song birds are in far better case than the game birds and water-fowl. I believe that none of the eastern New York song-bird species of Hudson's day have become extinct, nor anywhere near it. Every spring and summer the sweet wild-wood melody of the **Wood Thrush** rings day after day through the leafy aisles of the Zoological Park, and like the flash of a fiery feathered meteor, the **Scarlet Tanager** streaks through the woods and across our lawns, close before



THE BALD EAGLE.

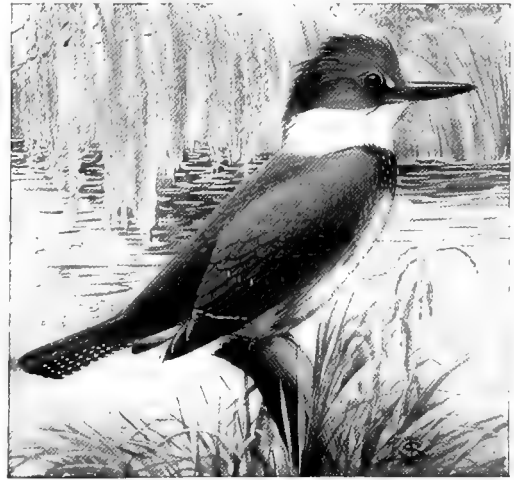


AMERICAN OSPREY.



AMERICAN BITTERN.

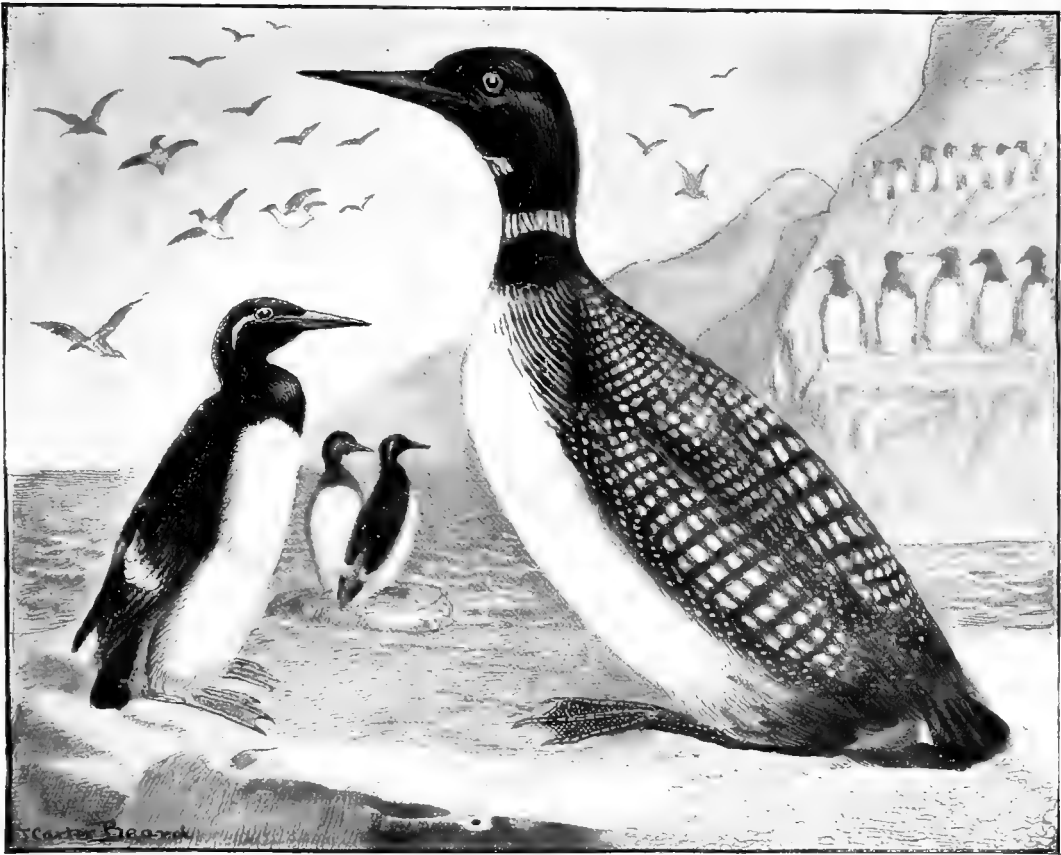
our startled eyes. Our dear old friend the **Robin**, than whom we love none better, joyously accepts our protection, and nests within easy reach of our hands. And only this very spring, even while our men were working in an elephant yard, completing the paving, a Robin built its nest on the frame of the big steel gate of the elephants' fence, that swung within close proximity to an active steam roller and a dozen busy men! And this while the gate daily swung to and fro. Our men were all very proud of this vote of confidence, but alas! the work had to go on. Just as we feared, the bird found the position untenable, and finally it flew away and built another nest in a less busy spot. Another Robin, with more wisdom, built her nest on one of the corral gates of the Antelope House, and although the gate is opened widely every day for the cart to pass through, she successfully reared her brood.



THE BELTED KINGFISHER.

The **Bluebird** still comes to us abundantly in spring, and in the cat-tail marshes along the Hudson and elsewhere,

"The **Red-Wing** pipes his o-ka-lee!" just as it has for a hundred years, and we know not how many more. And be it remarked here that amid at least a hundred species of song-birds now kept in the Zoological Park, indoors and out, the Red-Winged Blackbird is the most persistent singer, the most theatrical, and in my opinion very nearly the sweetest singer of them all. In our big outdoor cages, wherein the flocks scarcely know that they are confined, they sing more joyously and persistently than I ever heard them in their own cat-tail marshes.



COMMON MURRE.

THE LOON.

The **Rose-Breasted Grosbeak** is not abundant in eastern New York, and although his champions claim that he is a bonnie singer, they can not prove it by the bird himself. But to the eye he is fine, even though he is "no great hand at the pipes."

The **Baltimore Oriole**, dean of the faculty of feathered architects, is much too rare; for a thousand times the number that now visit our village streets and woods would be none too many. His swinging nest, preferably hanging from a down-drooping terminal twig of an elm, is one of the most wonderful manifestations of bird-wisdom and architectural skill that America produces.

Although practically all Americans have now been educated entirely beyond the killing of song-birds,—*the most valuable friends of every farmer and fruit grower*,—there is danger in the air. From southern Europe there have come to this country, for revenue only, hundreds of thousands of Italian laborers by whom every song-bird is regarded as legitimate prey for the pot! Every camp or large settlement of Italian labor-

ers is a center of song-bird destruction. Look out for them! Curb them! The laws are entirely adequate; please see to it that they are enforced. By the laws of the state of New York, no unnaturalized alien may carry firearms; and the penalties for doing so are very severe. Even in New York city, the Zoological Society has had to put forth a great effort to stop the wholesale killing of song-birds, by Italians, within two miles of our Park!

We greatly regret the fact that throughout the North generally, the pestiferous English Sparrow has to a great extent driven out the **House Wren** and the **Martin**. Both those species loved the haunts and companionship of man, until the coming of Ahab, the sparrow. If the latter could be exterminated, the other two species would immediately return.

Of all the feathered foresters that specially look after the insects that damage forest trees, the most showy and picturesque are the **Golden-Winged** and **Red-Headed Woodpeckers**. Poor indeed is the forest or wood lot that has not at least one of them. The former is



GREAT BLUE HERON.

gloriously abundant throughout the valley of the Hudson, but the latter is at most seasons quite rare. In my boyhood days I despised the abundance of the Red-Head, and foolishly spurned it; but the cash value of the woodpeckers generally is now understood in a way that it was not forty years ago.

The owls that hooted in the woods of Manhattan three hundred years ago still maintain their lines of descent. In spite of guns, traps and poison, the **Great Horned Owl**, the **Barred** and the **Screech Owl** will not down.



AMERICAN WOODCOCK.

All three persist today, even in the Borough of the Bronx. Only four years ago I was one night assaulted in Moshulu Parkway by a Screech Owl who rashly leaped to the conclusion that I was an ornithologist, and therefore dangerous both to her brood and her nest. Half a dozen times she dashed by on angry wing, so close to my face that I feared for my eyes. And it was only last spring that a Barred Owl came to grief in the Zoological Park, in this wise:

On three successive mornings, the men of the Bird House found that during the night something with savage beak and claws had caught several song birds in the outside cages, *through the wire netting*, killed them, and partly devoured them. Swearing vengeance, the keepers cunningly laid a trap on the roof of the cages, consisting of a dead bird neatly surrounded with an environment of limed sticks, like a score of lead pencils. In the cold, gray dawn of the morning after, the avengers found, helplessly flopping around on the cage roof, the Barred Owl bird-murderer, with limed sticks all over him, wondering what had happened to him, and why he was quite unable to fly.

Not for long was he left in doubt; for the keepers of song-birds believe in the survival of the fittest.

Throughout the Hudson valley, but not counting the Adirondacks, the ground game-



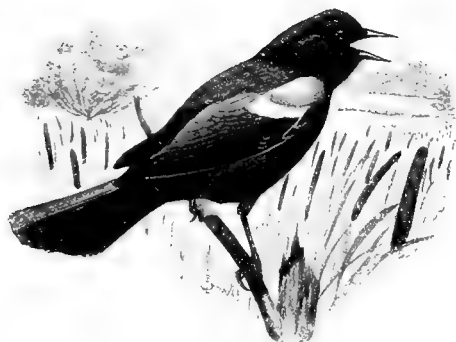
WILSON'S SNIPLE.



ROBIN.



BLUEBIRD.



RED-WINGED BLACKBIRD.



LOGGERHEAD SHRIKE.



ROSE-BREASTED GROSBEAK.

birds are to be reckoned with the things that have been, rather than the things that are. While it is true that the **Ruffed Grouse** and the **Bob White** are not by any means extinct in eastern New York, so very few remain they are hardly to be taken into account. Elsewhere in New York state, there are localities in which the shooter may find some of these birds to shoot; but here he can only "hunt" for them, and sagely wonder why they exist no more. It is high time to enact a ten-years close season for both the species named above.

The breeding of wild birds in captivity is now attracting much attention, and the propagation of gallinaceous game birds in preserves, as a legitimate industry, is directly in line with the preservation of our small remnant of Bob-White, Ruffed Grouse and Pinnated Grouse.

There are two habitants of the Hudson Valley that we could lose only with keen regret, but both are gradually fading away. The nocturnal **Whippoorwill** is known by his picturesque and far-reaching twilight song,—or whistle,—for the call surely belongs in the whistle class, and it is easily imitated by any good whistler.

When the mantle of night has fallen over the few country places that remain in the East, and the busy world is still, those who dwell in summer near quiet woods often hear a loud, clear and altogether melodious whistle from somewhere near the barn. As plainly as print it says, with sharp emphasis, "*Whip-poor-Will*;" and repeats it many times. Before each regular call there is a faint "chuck," or catching of the breath, strong emphasis on the "whip," and at the end a clear, piercing whistle that is positively thrilling.

Sometimes the bird will perch within thirty feet of your tent-door, and whistle at the rate of forty whippoorwills to the minute. Its call awakens sentimental reflections, and upon most persons exercises a soothing influence. It has been celebrated in several beautiful poems and songs.

This bird,—like the next species to be mentioned,—is strictly insectivorous in its food habits, and renders excellent service to man. In perching it chooses a large and nearly longitudinal limb, on which it sits lengthwise, in close imitation of a bark-covered knot.

The **Night-"Hawk,"** is closely related to the preceding species, but is very far removed from the real hawks. The Whippoorwill is known by being heard, through darkness, but the Night-Hawk strongly appeals to the eye. When the western sun is far down, and the evening air is still, watch for a dark-colored bird with long and sharp-pointed wings gracefully cleaving the air three hundred feet above the earth. If it has a large white spot under each wing, and is busy catching insects in mid-air, of a surety the bird is a Night-Hawk.

But for one thing, we could wish that we could have been the official naturalist of the "*Half-Moon*," and seen all the birds that Hudson saw; and that is,—we would much rather be alive today. Thanks to many factors, the Hudson valley has not yet been seriously denuded of its forests; but for all that, the status of wild bird-life within it has greatly changed for the worse. The waterfowl and the gallinaceous game-birds have been almost annihilated; and of the herons, egrets, plovers, sandpipers, and large bird forms of every kind, it is probable that less than one one-hundredth now remain.

To a great extent, this is the inevitable result of the settlement of a virgin wilderness by a seething mass of predatory, bird-killing, wild-life-destroying human population; but at the same time the cultivated fields and fruit trees have brought a population of insectivorous birds probably much greater than that which existed here in the days of the forest primeval.

Of the birds that were abundant four hundred years ago, the Great Auk, Labrador Duck and Passenger Pigeon are now totally extinct. The Trumpeter Swan, Carolina Parakeet, Whooping Crane and Heath Hen are on the verge of extinction, and very soon will join the Great Auk and the Dodo. In exchange for the North American species that are wholly or nearly gone, we have acquired—what? Ahab, the English Sparrow, and the Starling,—no more.

Today the lovers of wild life are engaged in a hand-to-hand struggle with the grand army of annihilators, to save at least a respectable remnant of our wild life and forests for the millions of Americans who come after us. It will be well for us if we so discharge our obligations that posterity will not have cause to heap curses upon us for our improvidence, and for our dereliction in the duties of good citizenship.



BALTIMORE ORIOLE AND NEST.



HOUSE-WREN.



PURPLE MARTIN.



SCARLET TANAGER.



GOLDEN-WINGED WOODPECKER.



RED-HEADED WOODPECKER.



SCREECH-OWL.



Copyright, 1902, by W. L. UNDERWOOD
BARRED OWLS.



GREAT HORNED OWL.
With "horns" laid back in anger.



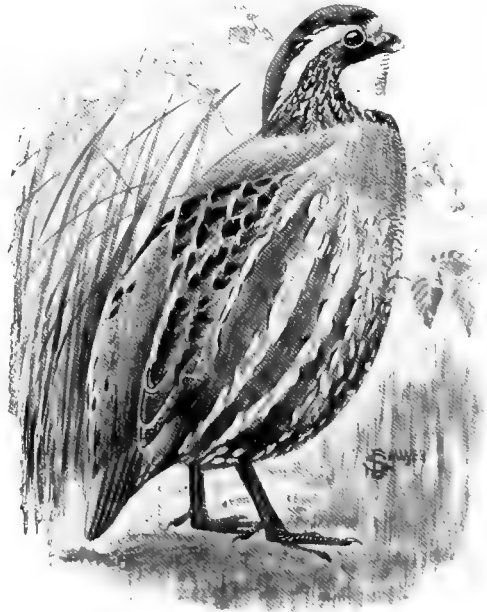
EASTERN RUFFED GROUSE.

The finest gallinaceous game bird of the northeastern United States. Still fairly abundant in the Adirondacks, and the wilder portions of the Catskill region. It is much in need of a ten-year period of absolute protection.

THE IRREPRESSIBLE CONFLICT.

The warfare for the protection of wild life should be just as constant and unremitting as is the manufacture of cartridges. If anyone who reads the literature of the wild-life protectionists is impressed by the repetition of the arguments and exhortations set forth, let him remember that the men who make guns and cartridges work constantly, and know no such thing as weariness. A competent authority has estimated that in the United States there are sold each year about 500,000 shot-guns and 7,000,000 loaded cartridges!

More than this, every year sees new and more deadly guns invented and placed upon the market, for the more rapid and effective slaughter of wild creatures. The great desire of the gun-maker is to give the game absolutely no chance to escape. To-day the perfection of long-range sporting rifles is so great it is difficult to find a man or twelve-year-old boy so unskillful that he cannot go out into the haunts of big game and kill a good "bag." Several American women have killed huge elephants in Africa, and many a boy in his early teens has killed his moose in Maine, Canada or New Brunswick,—all through the deadly perfection of modern repeating rifles.



BOB-WHITE.



CAT-BIRD.

HOW TO BRING BACK THE BIRDS.

In the restoration of depleted wild life, Nature is kind and long-suffering. Up to a certain point, man's destructiveness is forgiven, and the damage is repaired. But the slaughter must not go too far, or the damage will be beyond repair.

One of the most remarkable of the mental traits of wild creatures is the marvelous quickness with which they become aware of the fact that they are protected, and that within certain boundaries their lives are secure. When protection is declared they forgive and forget the slaughterings of the past, and begin life anew. When peace has been established, even the wildest and wariest birds, such as wild ducks that have been long harried by gunners, learn of it in an incredibly short time.

In the Dakotas, during the close season the wild ducks live near the haunts of man in a way that the killing season quickly renders fatal.

To country dwellers, many ways are open whereby they can increase the volume of bird life. Let us enumerate a few of them:

Every farm and wood lot should be posted by the owner or occupant, sternly forbidding all shooting and trapping thereon.

Every country dweller should see to it, by force of arms if necessary, that throughout his sphere of influence the laws protecting wild life are strictly enforced.

Certain wild birds should be fed, especially in winter. For the Bob-White and Grouse, put out corn and wheat screenings. For the Woodpeckers, Nuthatches, Chickadees and others of the hardy "winter residents," nail to the tree-trunks many strips of fat pork and chunks of suet. The services that those birds render your

trees are well worth the cost of fifty pounds of pork.

The Ducks, Snipe and Woodcock need only wet ground, water and protection.

To encourage Wrens, put up nest-boxes with holes so small that the English Sparrow can not enter them. A silver quarter will give you the right size for a Wren hole; but punch holes in the bottom of the can or box, so that all water that runs in will also run out.

Shoot the English Sparrows from your premises, and better birds will take their places.

If a bold-hearted Robin elects to try wintering near you, feed him in winter, without fail. It is safe to say that many species of our song and insectivorous birds could easily survive the cold of our winters if they could obtain a constant supply of food. It is not the cold that drives them South, but the annual failure of their food supply.

For all game birds, the great action to be desired and sought is the enactment of ten-year close seasons, covering wide areas. To this the men who think only of to-day, and scoff at "the future," will strenuously object. They would rather annihilate the remnant to-day than have an abundance ten or twenty years hence. But they represent the spirit of destruction, and wastefulness of the resources of Nature. We are in no way bound to respect their views or their wishes. If the annihilators were given free rein, twenty-five years hence would see the United States as barren of bird life as the Desert of Sahara.

During the past ten years the champions of bird life have made their influence widely felt. In many a hard-fought contest the destroyers have been routed, horse, foot and dragoons; and we believe that on the whole, the American people have "not yet begun to fight" for their birds.



NIGHT-"HAWK."



Painted by CARL RUNGJUS.

WHITE-TAILED DEER.

THE WILD ANIMALS OF HUDSON'S DAY.

PART II.—THE MAMMALS.*

THE wild mammals today inhabiting the Hudson valley are but a pitiful remnant of the original stock that flourished here three hundred years ago. Head by head, they represent merely the individuals that man, the cruel annihilator, has not been shrewd enough to find and kill. They do indeed represent the survival of the fittest in "civilized" environment. Think of a civilization so cruel that it must curb, by the stern hand of the Law, many of its members from killing does and fawns, from slaughtering gray squirrels and song birds for "food," from robbing birds' nests, and exterminating wild life, generally.

So far as wild life is concerned, there are no greater savages, living or dead, than five per cent. of the people who wear the garb of "civilization."

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We repeat that every wild animal now alive in the state of New York owes its existence to its own skill in hiding, and in living in defiance of dangers and difficulties. The only species that has been for even a score of years under the law's protection is the **White-Tailed Deer**, or **Virginia Deer**, which, but for its marvelous cunning and skill in woodcraft would long ago have been exterminated with the elk and moose that once inhabited the Adirondacks.

Of course the White-Tailed Deer flourished abundantly in the days of the "*Half-Moon*." We can imagine that almost anywhere along the Hudson where the banks were generously planted with brush and timber, three centuries ago a hunter could have landed on the shore and in an hour brought back a deer. Even during the past two years, two wild White-Tails have been caught alive while swimming in the Hudson River, and one is now on exhibition in the Zoological Park.

So far as we know, the only wild game of the Hudson valley that came aboard the "*Half-*"



1. OTTER.

2. FISHER.

3. MARTEN.

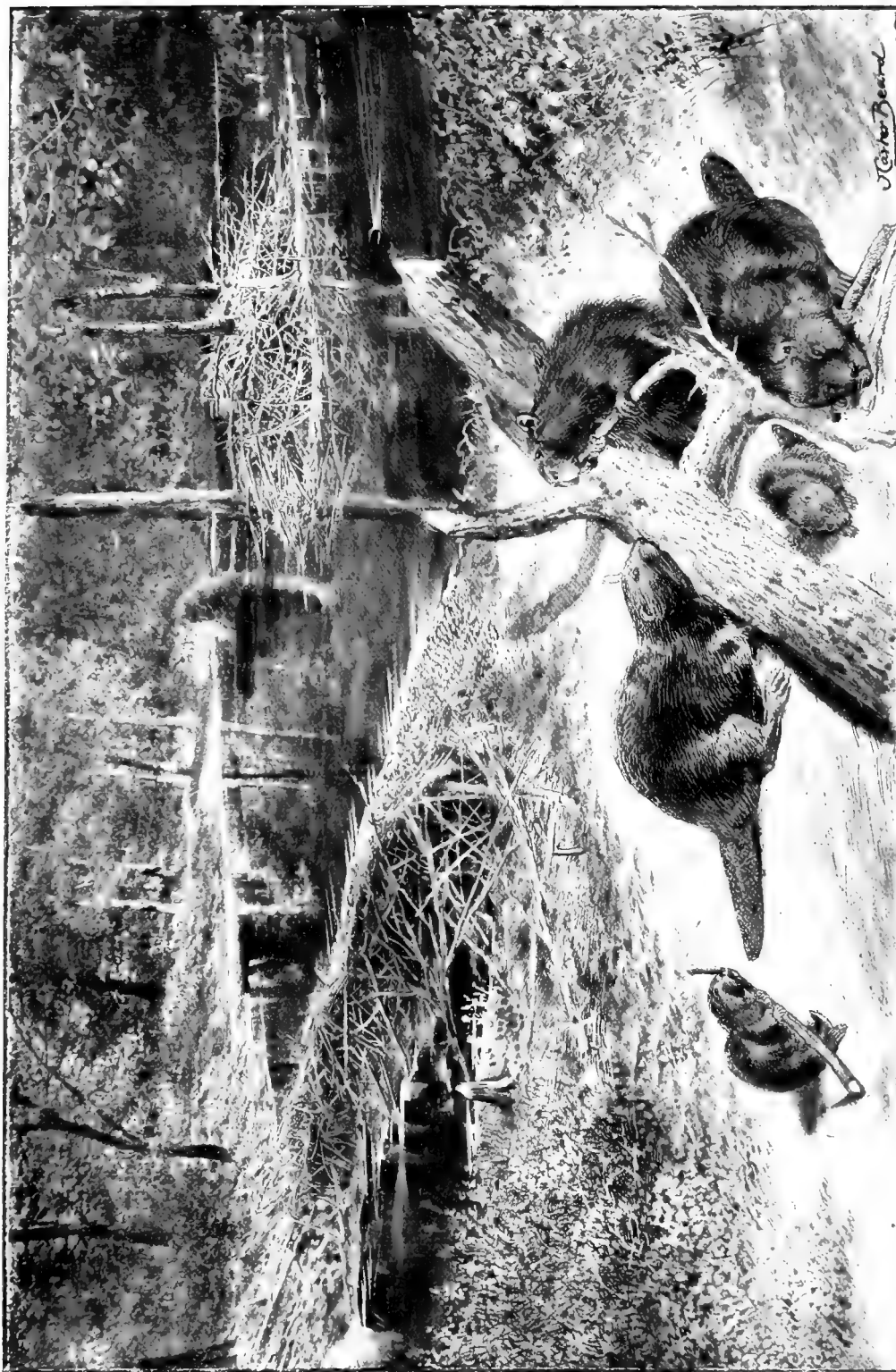
4. MINK.

Moon" was the flesh of a White-Tailed Deer. It was when that venturesome vessel reached the head of navigation of the Hudson River, probably near Troy, that the explorers found the Indians "very pleasant people." The Savages came on board, and brought "a great Platter of Venison, dressed by themselves; and they caused him [Hudson] to eat with them; then they made him reverence"; and after all this had been accomplished, on September 23, the "*Half-Moon*" started to return down the Hudson. At the Highlands, other Indians came aboard, and

"brought some small skinnies with them, which we bought for Knives and Trifles."

For two centuries the White-Tailed Deer was the best wild friend of the American pioneer. Many a brave family "on the frontier," fighting the wilderness and the Indians for the thing most dear to the native-American heart,—a free Home,—would have gone hungry, and perhaps found life actually insupportable, without the succulent flesh of the ever-faithful White-Tail.

It was indeed most fortunate for the American colonists that it was of almost universal distri-



AMERICAN BEAVERS AND THEIR WORK.

The dam, and house of sticks in the middle of the pond, are exact reproductions of those works in the Beaver Pond of the New York Zoological Park, as they were at the time this drawing was made.



AMERICAN BLACK BEAR.

bution throughout the timbered portions of the eastern United States. It is because of the important part played by the White-Tailed Deer in our colonial development that today we give its portrait the place of honor on our title page.

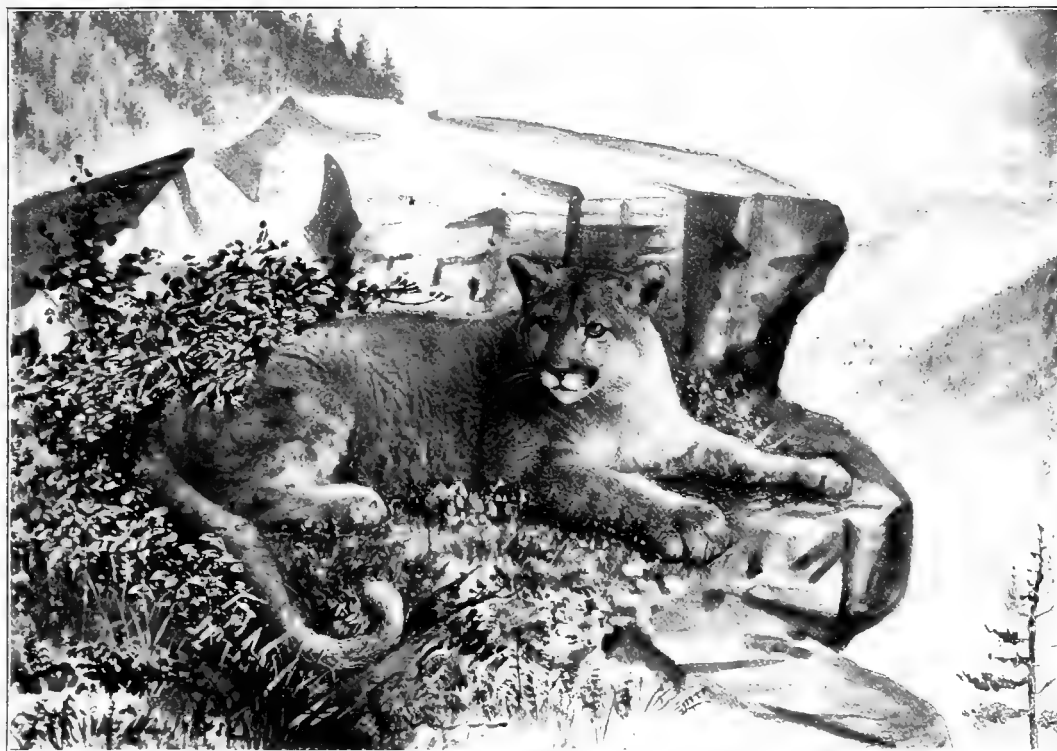
We are heartily glad that this is the most persistent species of all North American big game. It does not glory in the exhibition of its fine proportions at the risk of its life. On the contrary, it seeks the densest woods and brush cover that it can find, noiselessly steals through it with head and neck carried low and pointing straight forward, and leaves the honest and sportsmanlike still hunter only a trail of heart-breaking dinness. Thanks to wise laws and their rigid enforcement, the state of Maine today contains perhaps 100,000 White-Tailed Deer; and the hunting of the male "increase" furnishes legitimate sport for 3000 men, and an annual revenue to the state of more than \$1,000,000.

In our beloved Adirondack wilderness, this deer still exists; but it has been shot far too much. There are localities that now should be

alive with deer, but in which none are to be found, save at very long intervals. During the past ten years, protection has had the curious effect of bringing a wave of deer migration from the north down through Connecticut to the Sound, and down the Hudson valley actually to the northern boundary of New York City. We possess a wild female that was caught in Yonkers!

The first wild-animal products of our coast that came into the hands of Hudson were furs, offered in trade by the Indians of the coast. The historian says that "many brought us Bevers skinned, and Otters skinned, which we bought for Beades, Knives and Hatchets."

In the days of the colonists, the first traffic with the Indians was for their corn and furs. Beyond all doubt, the first products of the Hudson valley that crossed the Atlantic were Indian-caught skins of **Beaver**, **Otter**, **Marten**, **Mink** and **Muskrat**. In early times, the **Fisher** was also among those present, but never in great abundance, and it soon ceased to be a



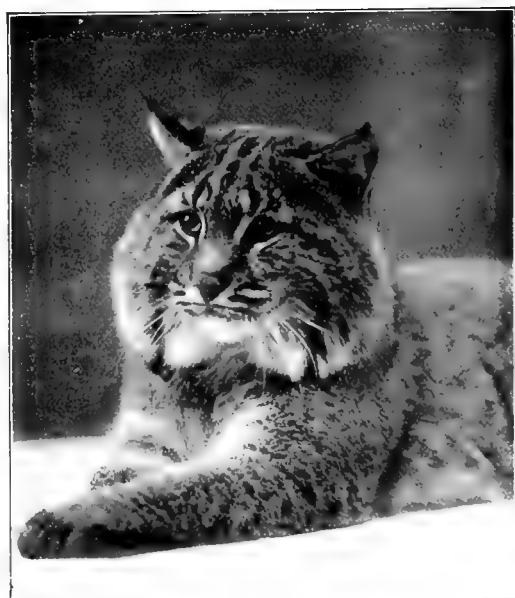
By permission of *Outdoor Life Magazine*.

THE PUMA, OR MOUNTAIN "LION."



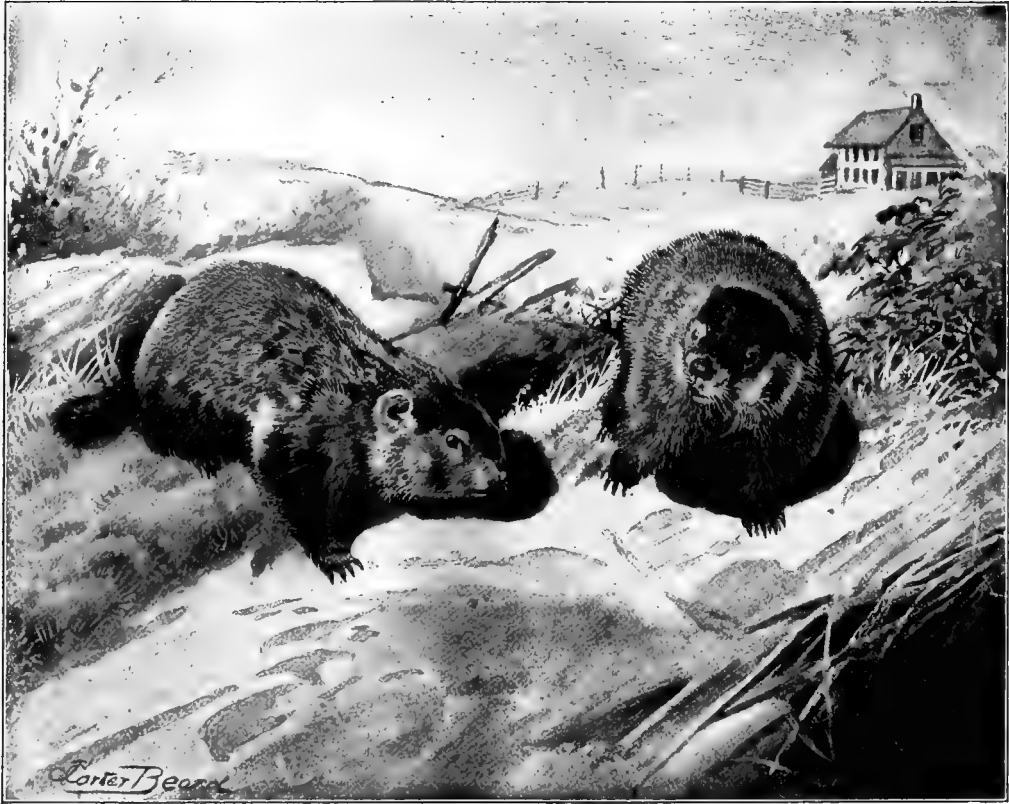
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THE RACCOON.



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BAY LYNX.



WOODCHUCK.

prominent feature of the fur trade of the middle colonies. It is but natural that the men who risked so much in venturing to America, 300 years ago, should desire to carry back something that could be converted into cash. It was the animals named above that laid the foundations of the American fur trade, generally, and of the Hudson Bay and North American Fur Companies, in particular. It would take long columns of figures, in large sums, to represent the part played by the fur-bearing animals named above in the commercial development of the American colonies.

But there is one very interesting fact in this connection that we must set down. Of all the fur-bearing animals of the Hudson valley, the most persistent today are the Muskrat and the Mink. Strange as it may seem, for ten years they have been to the New York Zoological Park, jointly and severally, a great nuisance.

For eight years, or during the existence of several piles of large rocks near our northern boundary, wild Minks have raided our bird collections, and slaughtered Gulls and other fish-eating waterfowl at a rate that was most exasperating. From 1900 to 1906 we killed in

the Park, annually, from three to five Minks; and they killed annually from ten to thirty of our birds. Now that their shelter rocks are gone, and the most of the Minks have been trapped and killed, we have peace.

Muskrats have been so abundant in the Bronx River and Bronx Lake, within our own grounds, and have done so much damage to our valuable aquatic plants, we have made war upon them, in self-defense. In the winter of 1908-9 a member of our force caught 23 of them, in our own waters.

The **Otter** once was abundant in the Adirondacks, and its range extended thence southward without a break to central Florida, where it still persists in living. It still is found occasionally in the North Woods, but it is doubtful whether it survives today in the Hudson valley anywhere south of Troy. So rare is this species throughout the United States it is no longer possible to secure alive and unhurt by traps a number sufficient to stock the largest zoological gardens of the eastern states. The steel traps, mills and sewage of civilization are too much for an animal that is dependent upon streams of water for



CANADA PORCUPINE.

its food and its life, and yet is not nearly so expert in hiding as is the muskrat and the mink.

When abundant and unmolested, the Otter amuses itself by establishing a "shoot the chutes" of its own, on a steep and slippery bank, ending in a water plunge. The Otter "slides," and the games played upon them, are well known to trappers and others who have lived or hunted where Otters were abundant.

In the time of Hudson, there were probably two million **Beavers** living in what is now the state of New York. About 1670 the Dutch province of New Netherland annually furnished to the fur trade 80,000 Beaver skins, and in 1623 the Beaver was formerly incorporated in the seal of that colony.

In 1860 the Beaver had so nearly disappeared from the Adirondacks and the Hudson valley that even in the former locality the total number alive was estimated at only 60 individuals. By 1895 this had fallen to "5 or 10." Since that date, 34 individuals have been set free in the Adirondacks, chiefly through the efforts of Harry V. Radford, and they are slowly restocking the North Woods.

The **Black Bear**, the **Puma** and the **Canada Lynx** once thrilled, and at times terrorized, the

colonists of eastern New York; but gradually they all disappeared from practically every portion of New York save the Adirondacks and the Catskills. Strange to say, the largest animal of this trio, the Bear, has been most cunning and successful in resisting extermination. While the Puma is entirely extinct in this State, and the Canada Lynx practically so, the big and burly Black Bear joyously holds on, both in the Adirondacks and the Catskills. The familiar Bay Lynx still is in our midst, and one was seen in the Catskills, by H. W. Merkel and A. P. Dienst, in the spring of the present year.

The **Raccoon** once was an animal of practically universal distribution throughout the wooded portions of New York state, but its place in the list of fur-bearing animals has been fatal to its continued abundance. It still lives, however, even numerous in places, and still may be regarded as one of our most common quadrupeds of medium size. Firmly and persistently, it refuses to be exterminated, and so long as the forests remain, it will live to inhabit them. Today its fur is really valuable,—because better furs are so rare.

The members of the Order of Rodents, or gnawers, are today our most abundant wild



FLYING SQUIRREL.



GRAY SQUIRREL.

quadrupeds; and we are thankful that none of them yield "fur!" Thus far the rapacious maw of the "fur trade" has not demanded the skins of the **Woodchuck, Gray Squirrel, Chipmunk, Flying Squirrel** or **Red Squirrel**, But whenever any of those species are definitely placed in the class of fur-bearing animals, their doom is sealed. At present,—when not easily found and killed,—they are permitted to live and make glad the waste places.

Even the finest forest is half dead if it be destitute of the vital spark that wild-animal life alone can give.

In cheerful companionship and popular interest, the Gray Squirrel would be worth half a million dollars a year to the people of New York—if *they would but let it alone!* But

where is the Gray Squirrel today? You may ride or drive in midsummer from one end of New York to the other without finding a single one alive, unless it is in a protected park!

Americans are queer animals. There are men and boys who still think it is "sport," and "hunting," to shoot squirrels,—under far less difficulty and danger than would lie in potting chickens in a farmer's orchard! And we Americans actually *eat* a rodent with flesh so rat-like that the white men of all other nations



EASTERN RED SQUIRREL.



EASTERN CHIPMUNK.

decline it. I refer to the Gray and Fox Squirrels.

It is indeed high time that the Gray Squirrel should be perpetually protected, everywhere throughout this gun-ridden state.

The delightful little **Chipmunk** is a thing of beauty, and its cheerfulness is a perpetual joy. Being very small and commercially valueless, it has not been pursued quite so persistently as



RED FOX.

the larger squirrels and rabbits; but for all that, the cat and the bad boy have made it rare everywhere outside of parks.

In the Zoological Park, it is really pathetic to see how quickly the wild creatures respond to protection, and make friends with those who will not permit them to be molested. Take the **Gray Rabbit**, as an illustration.

Eight years after the opening of the Park, Gray Squirrels, Chipmunks and Gray Rabbits had become very numerous within it, and almost fearless! In June, 1909, at midday, a wild Rabbit very leisurely hopped past me as I came out of my office, not more than twenty feet away, quite as confidently as if he owned the whole place. At fifty feet, all unafraid he halted close beside a big oak tree, in full view of fifty persons, leisurely examined the ground, and presently loped on across the grass into the shrubbery.

The reason? Our grounds are the only wooded lands in northern New York City in which stray dogs, cats, poachers and other vermin are not permitted to run at large. Two years ago our Chief Forester estimated that 75 wild Rabbits were living and breeding in our grounds. Of chipmunks we have hundreds, and of Gray Squirrels at least fifty. Needless to say, the children and all other people who love animals, are greatly interested by them.

The **Great Northern Hare**, gray in summer and snow white in winter, and once abundant, is now so rare that only the skilful "up-state" hunter can find one, in swamp or wilderness far from the haunts of men. It is a pity, too; for because of its great scarcity, and the fact that it does not thrive in captivity, this fine animal is almost as unknown and mythical to the vast majority of persons as the *gyas-cutus*.

By his continued existence in spite of traps, hounds, and guns of all sorts, the **Red Fox** has ably and satisfactorily demonstrated his right to live. Any sane person who knows the tremendous difficulties and dangers amid which any Fox of "civilization" lives and breeds, surely will not ask, as a serious question, "Do Foxes reason?" Excepting the real lovers of nature, every man's hand,—and firearm also,—is against him. The farmer hunts him for revenge, the trapper for his pelt, the hunter for sport. And yet, compared with that wonderfully sharp nose, and those keen eyes and ears, wireless telegraphy is slow and uncertain. Were it not so, there would not be today one living Red or Gray Fox this side of the Adirondack wilderness; but as it is, both those species joyously live and breed, even up to the very boundaries of the most populous city of America.



VIRGINIA OPOSSUMS.

In the distribution of the Marsupials, or mammals with abdominal pouches for their young, Nature almost overlooked North America! We have only the **Opossum**, nocturnal, sly, and so unobtrusive that in the northern United States it has reduced self-effacement to an exact science.

Some naturalists suppose that the most remarkable thing about this animal is its pouch;

but that is not the case. The strangest thing is that it knows enough to *feign death* in order to escape injury. I know, because in my boyhood days an Opossum deceived me so completely and thoroughly that I have not yet fully recovered from the shock. The animal very nearly escaped through the trick that it so skilfully played upon me; and since that day I have wished a thousand times that I had given that Opossum its freedom, as a reward of merit. But I did not think of it in time.

If our wild animals possessed as little reason and foresight as some men, all of them would have been killed or starved to death long ago.

PRESENT STATUS OF BIRD STUDY.

During the past ten years, the status of bird-study in America has undergone an important change. Yesterday was the day of the old-fashioned ornithologist,—diligent in the killing of birds in great numbers in order to study their geographic, seasonal, sexual and other variations, and also diligent in the differentiation of new forms. At the same time, under the sheltering guise of “scientific purposes,” hundreds of thousands of the eggs of wild birds have been collected by unscientific men and boys, and stored away in dark cabinets,—to very small purpose.

The total number of birds and eggs collected during the past fifty years in the sacred name of science must be something enormous. Perhaps two per cent. of the entire slaughter have served genuine scientific purposes; but we doubt it.

To-day, it is no exaggeration to say that a large number of the people who are keenly interested in the birds of North America are weary of the once-popular studies of minute geographic variations, the making of new subspecies, and the vexatious changing of scientific names that, like the brook, seem destined to go on forever. The English names of our birds are in fact more stable and useful than those bestowed by the scientists.

To-day, the demand of the hour is for the utilization, in practical ways, of the enormous mass of American bird-lore that has been accumulated. *The unscientific millions desire to know about our birds the facts that are useful to man, and helpful to the birds.* Very unfortunately, the schools and colleges in which the foundations of natural-history teaching should be “truly and firmly” laid, as befits every foun-

dation stone, are sadly blundering in the business of teaching teachers how to teach. As a whole, the situation is in a most unsatisfactory state. But the nature teachers are at least aware that something is wrong; and that is the first promise of better things. It is high time for even the dumbest person to see that long and weary weeks spent on the anatomy of the grasshopper, butterfly, beetle and amoeba are not in line with the desires of bright boys and girls who want to know which are the most interesting, the most useful and the most injurious birds, mammals and reptiles of our country.

The study of natural history in public schools and colleges could be made as musical as Apollo's lute; and let us hope that some day it will be. Meanwhile, there is one great lesson that all may learn. It is this:

It is not always necessary to destroy wild life in order to study it. The study of birds can better begin with a bird book and a pair of sharp eyes than with a gun and a bushel of cartridges. The study of birds' eggs is all right, provided the birds of today do not have to pay the whole cost of it in fresh eggs. In the United States, the killing of birds for “scientific purposes” is now very rarely necessary, or justifiable.

The most advanced ornithologists of the present day are devoting their best attention to the study of living birds, and their relations to mankind. Practical aviculture is teaching many new and useful lessons which the study of dry skins and skeletons never have revealed. Mr. C. William Beebe, experimenting at the Park with live birds kept in atmospheres of varying degrees of humidity, has found that by means of an unusual degree of humidity it is easy to create new and startling “sub-species,” literally “while you wait.” It is unnecessary to point out the reasons why this discovery is of great practical importance to ornithologists.

Today, the highest duty of every lover of birds is to help protect the birds that remain. Nor is it necessary to have a speaking acquaintance with a bird before taking an interest in preserving it and its kind from annihilation. It is impossible to afford birds too much protection, too much immunity from the forces of destruction. Every child should be taught that without the assistance of the birds that destroy annually millions of noxious insects, rodents, and tons of seeds of noxious weeds, our country soon would become a barren waste.



LARGE BIRD-HOUSE AND ITALIAN GARDEN IN BAIRD COURT.

THE ZOOLOGICAL PARK OF OUR DAY.

By WILLIAM T. HORNADAY.

Photographically illustrated by ELWIN R. SANBORN.

DESPITE the greed and blood-lust of man, civilized as well as savage, this gun-ridden world still contains a marvelous array of wild life. It is right to speak of the animate portion of Nature's works as the animal kingdom. Man himself is the king of beasts, but there are many assistant kings and princes and potentates, some of which are in certain ways almost as interesting as himself.

Even in this day of endless travel and travelers, it is not everyone who can go to the ends of the earth; and of the human millions, only a very small percentage can make it possible to see many wild creatures in their haunts. Yet do people of intelligence desire to know the wild life of the world; and so we have systematic collections of animals, living and dead.

The highest function that any wild animal can serve, living or dead, is to go on exhibition,

as a representative of its species, to be seen and studied by millions of serious-minded people.

The imperial City of New York presents to the world her Zoological Park, and invites mankind to behold in it a huge living assemblage of beasts, birds and reptiles, gathered from every region of the globe, kept together in comfortable captivity, and skilfully fed and tended, in order that millions of people may know and appreciate the marvels of the Animal Kingdom. To make a Park and collection worthy of the fauna of the world, and of the metropolis of the New World, has been a gigantic task; but the people of New York have proven equal to it, and the result is now practically complete.

After three years of planning, and ten years of very strenuous work, we say that the Zoological Park is "practically complete;" and so

it is. Wise men will understand what we mean. We do not say that *nothing* more ever will be added, or that in the future no more improvements will be necessary. The actual work of building our Zebra House and Eagles' Aviary yet remains to be done; but both together are but a bagatelle, like the building of a garden summer-house for a stately mansion that is complete and occupied.

These pages are intended only as an invitation to the world to come, enter in and possess the New York Zoological Park. They are not intended as an exhibit of the dry bones of Detail. New York has dedicated to Zoology a princely and priceless domain of land and water, and she has almost unreservedly entrusted it to the wisdom and judgment and vital energy of the men who have made the New York Zoological Society.

On this marvelous site,—the most glorious handiwork of Nature ever placed within, or even near, a great City,—the Zoological Society expended in accommodations for animals a full quarter of a million dollars. That was just ten years ago. Having seen this evidence of good faith, the City of New York then generously—but not extravagantly or foolishly—opened her treasury, pledged her credit, and bore the expense of all the remainder of the permanent improvements. And at the same time, the City began to furnish annually a sum of money sufficient to maintain becomingly the new institution. This was done, not reluctantly nor grudgingly, but with a big-hearted generosity “that made the gift more precious.” The work of creating the Zoological Park has not halted for a single moment since the keel of it was laid on November 5th, 1906, when the “Preliminary Plan” was approved by the Executive Committee.

The “Preliminary Plan” of the Director was carefully expanded into an elaborate and beautiful “Final Plan,” which was approved by Mayor Strong and the Board of Park Commissioners in November, 1898. It is impossible to overstate the importance of that exhibit of the intentions of the Society to the progress of the Zoological Park. Other builders of American zoological parks may well follow the example of New York in having their future developments planned by competent experts for twenty years in advance.

In round numbers, the Zoological Society has expended on the Zoological Park and its animals about \$475,000; and on the buildings and other “ground improvements” the City has expended a little more than \$2,000,000. And

what is there to show for all this? This is a highly condensed answer:

Of large and fine buildings of the first rank, of brick and stone, there are to be seen the following:

- The Elephant House,
- “ Lion House,
- “ Primates House,
- “ Large Bird-House,
- “ Aquatic Bird-House,
- “ Administration Building,
- “ Reptile House,
- “ Small Mammal House,
- “ Ostrich House,
- “ Antelope House,
- “ Small-Deer House,
- “ Pheasants Aviary.

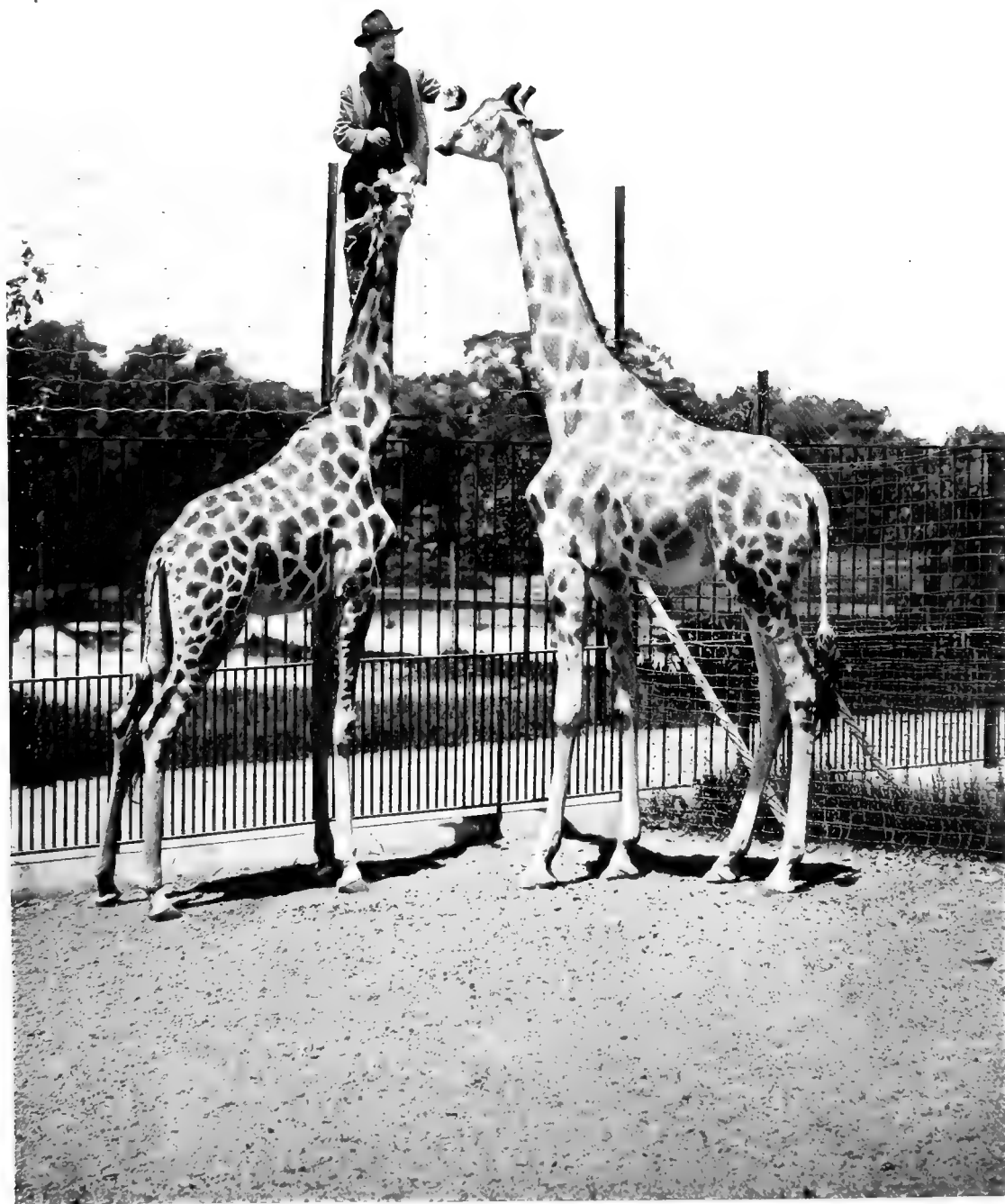
Of buildings of secondary importance there are:

- The Service Building,
- “ Asiatic Deer House,
- “ Red Deer House,
- “ Axis Deer House,
- “ Elk House,
- “ Camel House,
- “ Llama House,
- “ Goats House,
- “ Buffalo Barn,
- “ Feed Barn,
- “ Wild Horse Barns (2),
- “ Rocking Stone Restaurant,
- “ Boat House.

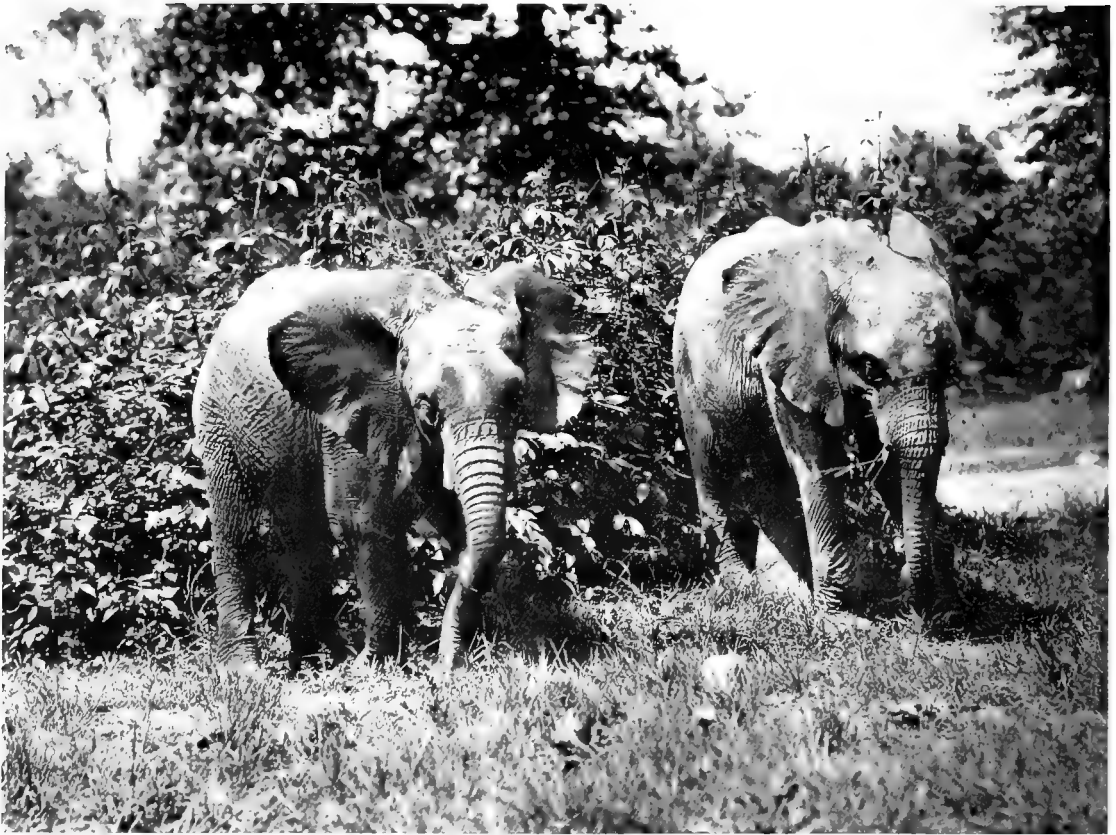
Of open-air installations for wild mammals and birds,—several of them very elaborate and costly,—there are the following important features:

- The Bear Dens,
- “ Flying Cage,
- “ Wolf Dens,
- “ Mountain Sheep Hill,
- “ Fox Dens,
- “ Sea-Lion Pool,
- “ Alligator Pool,
- “ Duck Aviary,
- “ Wild-Fowl Pond,
- “ Otter Pools,
- “ Beaver Pond,
- “ Burrowing Rodents' Quarters,
- “ Prairie-Dog Village,
- “ Puma House.

Of all the features named in the three lists given above, all save four are devoted to the systematic exhibition of living mammals, birds and reptiles. The list of secondary buildings gives not even a hint of the unequaled exhibition series of open-air ranges, surrounded by steel posts, steel wire and concrete foundations, that have so generously been provided for our herds.



NUBIAN GIRAFFES IN THE NEW YORK ZOOLOGICAL PARK.



THE AFRICAN ELEPHANTS, KARTOUM AND SULTANA.

of bison, elk, wild sheep, wild goats, ibex, and deer of all kinds.

It was an English critic who said that our open-air installations for animals are "at once the envy and the despair of all European zoologists." The finest ranges in the world for captive hoofed animals are those of the Duke of Bedford, at Woburn Abbey, England; and the herds within them are both in variety and in number, wholly beyond compare. But those herds are not on exhibition, and they can be seen only by a special invitation from the owner.

It is to be noted here that of the eleven large and important animal buildings enumerated in the first class, each one save the Reptile House is provided with an elaborate and extensive series of open-air yards in which every habitant has, in mild weather, a daily opportunity to spend hours in the sunlight and the open air, freely exercising or lying at ease in the shade. The elephants and rhinoceroses, the lions and tigers, the apes and baboons, the big African antelopes, the tropical deer, the ostriches and cassowaries, and even the smallest creatures of the many in the Small Mammal House, all have

their out-door quarters, and enjoy them to the full.

For humane men and women there is small pleasure in the contemplation of living creatures that are in prisons, and that look and feel like prisoners, pining behind their bars. Better no "zoos" and no wild animal collections than miserable and unhappy prisoners! *A badly-made or badly-kept "zoo," or zoological garden or park, is worse than none.* But, at the same time, it is folly for anyone to say that all zoological gardens and parks are dens of cruelty,—as is held by a few extreme humanitarians. The creatures in the collections of the Zoological Park give unimpeachable testimony to the contrary. If our bears, our hoofed animals, our birds and our apes and monkeys are not positively happy, and full of the enjoyment of life, then none are in this world, either captive or free. Today, the life of every free wild creature is constantly filled with alarm, with flyings from danger, and with the daily struggle for food, water and safety. Every hunter knows that after every mouthful of food, the wild animal or wild bird looks about for dangerous

enemies; and the ultra-humanitarians take small note of the millions of wild lives that are pulled down and destroyed by predatory enemies.

Of the great array of rare and interesting mammals, birds and reptiles today on exhibition in the New York Zoological Park, many pages would be needed to convey of them even a faint impression. The collections have been formed strictly on scientific lines. There are no half-breeds, no "curiosities," and no freaks of any kind save a few albinistic individuals.

On July 15th, 1909, an enumeration of the individuals and species alive and on exhibition in the Park showed the possession of the following:

TOTAL CENSUS OF WILD ANIMALS IN THE ZOOLOGICAL PARK, JULY 15TH, 1909.

| | Species. | Specimens. |
|----------------|----------|------------|
| Mammals | 246 | 743 |
| Birds | 644 | 2816 |
| Reptiles | 256 | 1969 |
| Total | 1146 | 5528 |

To the average mind, however, these figures convey but a slight impression, even when we state that in individuals we have the largest number (by about 1000) to be found today in any zoological garden or park.

Regarding the quality of our animal collections, a few words must suffice.

By way of illustration, what must the visitor think of a collection of African hoofed animals that contains a Mountain Zebra and Grant Zebra, two species of Elephants, a pair of Black Rhinoceroses, a Hippopotamus, a pair of Giraffes, a Sable Antelope, a Kudu, a Bakers Roan Antelope, an Addax, two species of Gnu, a Beisa, a breeding pair of Leucoryx Antelope, an Eland, a Waterbuck and a Wart-Hog?

And what shall be said of a collection of deer that contains a herd of Eld's Burmese Thameng, a herd of Barasingha, herds of Indian and of Malay Sambar; herds of Axis, Sika, Fallow, Red Deer, Wapiti of two continents, Kashmir Deer (Hangul), and pairs and singles of at least a dozen other species?

Consider for a moment the bears,—*seventeen* species, represented by 37 specimens, including four species of the gigantic Alaskan Brown Bear group, represented by seven specimens.

The collections of apes, baboons and monkeys, and of small mammals and large cats, are quite as rich as those mentioned above.

The collections of birds are fairly bewildering in variety and zoological richness. When any Zoological Park exhibits nearly 3000 live birds, of different kinds and sizes, gathered from a hundred different localities, there is no need to comment on the rank of the collection. And when it contains such feathered rarities as the California Condor, Harpy Eagle, Bateleur Eagle, Trumpeter Swan, Whooping Crane, Sun Bittern, Seriema, South American Trumpeter, Gyrfalcon, Sea Eagle, Yellow-Necked Cassowary, Hyacinthine Macaw, Black Cockatoo, Black-Backed Pelican, Ptarmigan, and a hundred smaller varieties, its scientific value is beyond question.

Of reptiles, the array is very comprehensive. It contains five species of Rattlesnakes, the King Cobra, Spectacled Cobra, Bushmaster, Fer-de-Lance, Puff Adder, five species of Crocodilians liberally represented, and Pythons, Boas, Anacondas, small Serpents, Lizards, Iguanas, Turtles, Tortoises, Terrapins and Amphibians in great variety.

The labeling of the living creatures in the Zoological Park, with descriptions, pictures, maps and charts, is far beyond the best results accomplished in that line elsewhere.

Thanks to the marvelously perfect site of 264 acres that New York City has provided for her exposition of living wild creatures, and thanks also to the wise use that has been made of it by the Zoological Society, the New York Zoological Park is today the foremost institution of its kind. It is no exaggeration to say that it is in a class by itself. Its grounds, its buildings and out-door compositions for animals, are of unrivalled excellence, and in zoological value its collections are now equal to the best elsewhere. This plain statement is made with full knowledge of what the world has done in this field, and what animal collections exist elsewhere. The elaborate official report of Dr. Gustave Loisel to the French government (1907-8) has enabled all the world to know the relative standing and merits of the zoological gardens and parks of the world.

This BULLETIN has been called for by the Hudson-Fulton Celebration Commission as a means of placing before the public certain facts regarding the wild life of eastern New York, and a zoological institution that as yet is inadequately known, even to the people of the Empire State. If the effort that has been made here, by the first City of America, were today anything else than the best of its kind thus far created, then would we need to apologize for a failure.



A PORTION OF BAIRD COURT, NEW YORK ZOOLOGICAL PARK.
Showing the Large Bird-House for Perching Birds, and the Sea-Lion Pool.



POLAR BEAR DEN IN THE NEW YORK ZOOLOGICAL PARK.

THE NEW YORK ZOOLOGICAL SOCIETY AND ITS WORK.

NO institution is greater than the organization that created it.

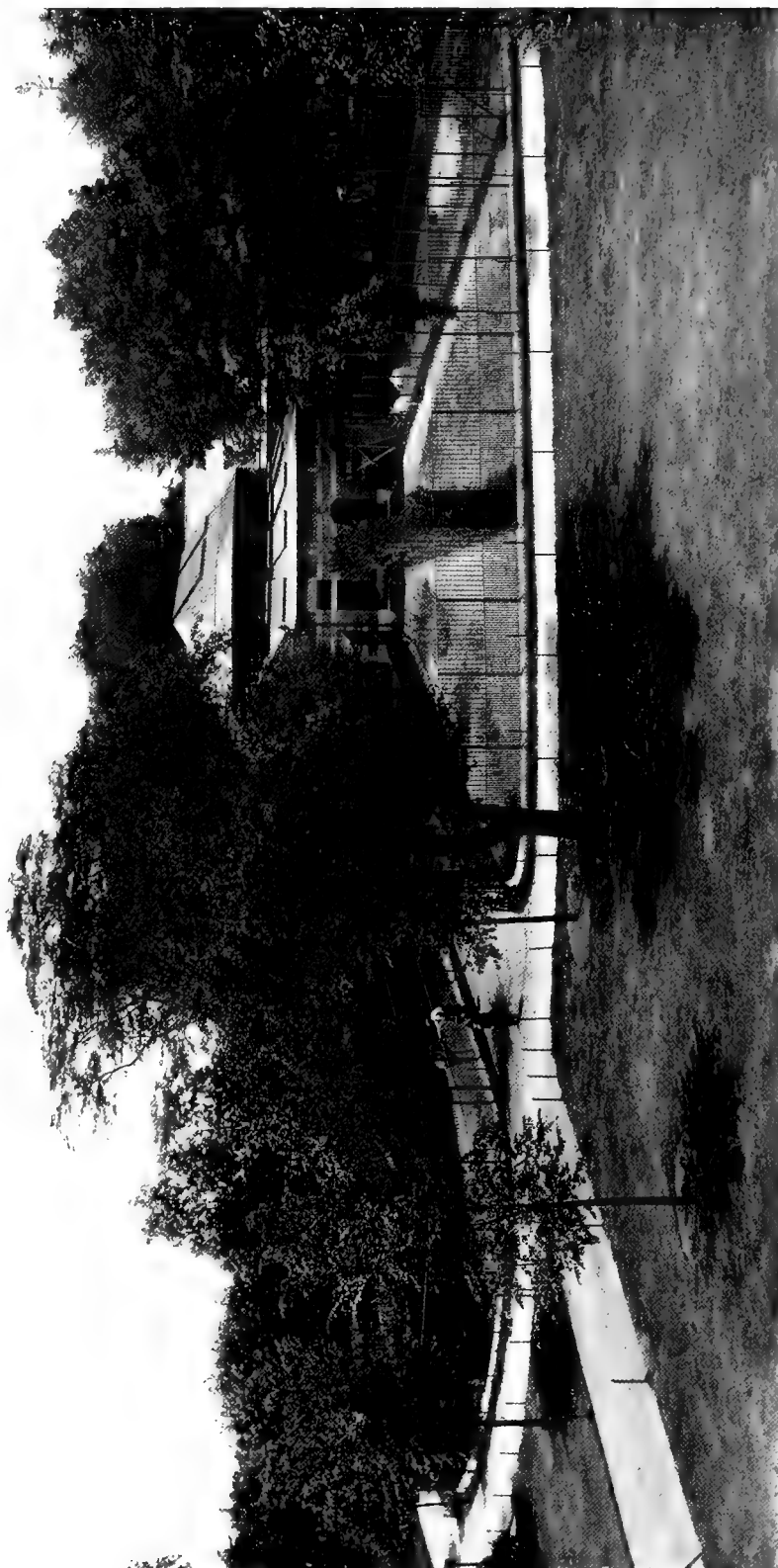
But for the New York Zoological Society, and the forces that it gathered to its aid, there would today be no New York Zoological Park. Even with the finest building materials ready to the hand of the builder, it is not given to every man, or every organization of men, to rear a monumental structure, and finish it ere the world grows weary of waiting.

Surely the Zoological Society may be regarded as one of the most remarkable of New York's many and diverse human products. Organized in 1895, at a period when to many it seemed as if New York's private philanthropy had been drained to its depths by museums, libraries, hospitals and botanical gardens, the hour of its birth seemed inauspicious. And to a very great extent that handicap did exist, *and remains upon the Society to this day!* The institutions referred to above have been endowed bountifully,

by money given in large sums, and therefore counting up rapidly. But not so this Society. From 1895 to the present hour, no sum larger than \$5,000 ever has come into our treasury from one donor at one time; and the only bequest ever received was one for \$100!

But it was ordained in the beginning that the Zoological Society should succeed, and do much with little. The three declared objects of the Society always have been—the making of a Zoological Park, the protection of our native animals and the promotion of zoology.

The first and by far the most serious of these tasks was undertaken first, and vigorously prosecuted. The result is in evidence, and can speak for itself. The second and third objects have not been pursued as diligently as the first, because of the practical impossibility of conducting three great campaigns simultaneously. Now, however, the scientific work of the Society, and its greater work for the protection of wild life, will be taken up on a new basis.



THE ANTELOPE HOUSE AND ITS OPEN-AIR CORRALS.

The original impulse and effort for the creation of the New York Zoological Society came from Madison Grant, then a sportsman and student of nature, and by profession a lawyer; and very early in its career the new organization secured the active support of Prof. Henry Fairfield Osborn. It is impossible to overstate the influence of those two men on the Society's undertaking, and their devotion to the task, year in and year out. Without them, New York would have at this time no Zoological Park!

I regard the Executive Committee of this Society as the most remarkable body of men with which I ever have come in contact. The manner in which those men of great affairs regularly, and even joyously, left "their mirth and their employment," to spend from two to four hours at a time in hard-working business meetings, month after month, for thirteen years, was, to at least one man, both an object lesson and an inspiration. Talk about civic pride, and the duties of good citizenship,—the Zoological Park is a lasting monument to that spirit as it exists in the 1666 members of this Society; and in saying this, we only render unto Cæsar the thing that is his.

For eleven years,—1898 to 1909,—the composition of the Executive Committee of the Society remained almost unchanged. Its members were:

Hon. Levi P. Morton, ex-officio, President of the Society.

Prof. Henry Fairfield Osborn, Vice-President, Chairman for seven years; now President.
Madison Grant, General Secretary.

Charles T. Barney, Chairman for three years, Treasurer four years.

John L. Cadwalader, Counsel.

William White Niles, Attorney.

Percy R. Pyne, Treasurer.

Samuel Thorne.

Capt. John S. Barnes.

Gen. Philip Schuyler.

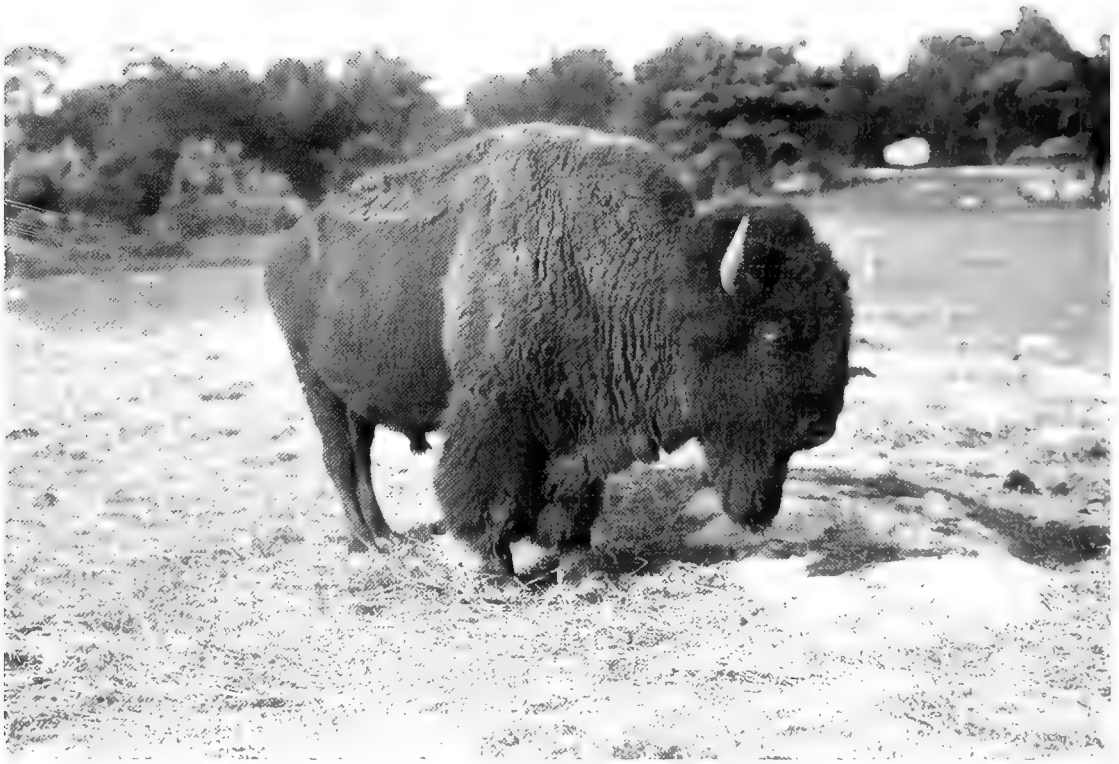
The vacancy caused by the death of Mr. Schuyler has recently been filled by the election of Mr. William Pierson Hamilton.

During the thirteen years of the Society's existence, the Executive Committee has held 169 meetings, and only one of them was without a quorum.

In 1899 the Zoological Society set the pace by expending nearly \$250,000 of its own funds in the erection of the Reptile House, the Aquatic Bird-House, the Bear Dens, Flying Cage and about eighteen smaller installations for animals.



HARPY EAGLE.



AMERICAN BISON BULL IN THE ZOOLOGICAL PARK.

The people of New York looked at the quality of the work, and saw that it was good. In fact, the public was surprised, both by the magnitude of the plan, and the permanence of all improvements. Then the City of New York cheerfully joined the Society in the remainder of the work. The Society of course was given absolute control of the Park, it furnished all plans, and virtually superintended all improvement work. The Park Department has stood in a position to safeguard all the interests of the taxpayers, and has awarded and superintended all large contracts for construction. Throughout eleven years of rushing improvement business, involving nearly a hundred contracts, great and small, the business of financing and building the Zoological Park has gone steadily on, without a single halt or an unpleasant episode between the representatives of the City and the Society. In their turn; Mayors Strong, Van Wyck, Low and McClellan, and Comptrollers Fitch, Coler, Grout and Metz have cordially cooperated in the work. The Park Department of the Bronx has been most helpful, and we recall with particular pleasure the cooperation of the three

long-term Commissioners, Moebus, Eustis and Berry, and their Chief Engineer and Chief Clerk, Martin Schenck and Gunther K. Ackermann.

While it is impossible to mention here even one-tenth of the generous people who for ten years or more have loyally supported the Zoological Society in all its undertakings, there are a few whom we must name, regardless of space limitations.

The members of the Executive Committee, the majority of whom have given the Society liberal sums of money, have already been mentioned.

We have received substantial aid from Andrew Carnegie, William Rockefeller, William C. Whitney, Jacob H. Schiff, Oswald Ottendorfer, Miss Helen Miller Gould, C. P. Huntington, William E. Dodge, George J. Gould, J. Pierpont Morgan, Col. Oliver H. Payne, Mrs. Fred-eric Ferris Thompson, Robert Goelet, George F. Baker, Edward J. Berwind, Frederick G. Bourne, Charles F. Dieterich, Emerson McMillin, F. Augustus Schermerhorn, John D. Rockefeller, William D. Sloane, Mrs. John B. Trevor, Mrs. Antoinette Eno Wood, William K. Vanderbilt,



THE CALIFORNIA CONDOR.



MOVING THE ALLIGATORS TO WINTER QUARTERS.

C. Ledyard Blair, Hugh J. Chisholm, George Crocker, Cleveland H. Dodge, E. H. Harriman, Mrs. Philip Schuyler, Lispenard Stewart, Miss Caroline Phelps Stokes, Mrs. Frank K. Sturgis, Tiffany and Company, Charles H. Senff, Cornelius Vanderbilt, Samuel D. Babcock, James C. Carter and Morris K. Jesup.

In addition to the above there are 38 Patrons, 189 Life Members and 1397 Annual Members whose constant and liberal support fairly entitles each one to honorable mention.

In mentioning the men who have made the Zoological Park, the public owes more than it ever is likely to know—or to fully repay—to the intelligence, the judgment, the constant devotion and the tireless energy of these officers of the Zoological Park:

H. Raymond Mitchell, Chief Clerk and Manager of Privileges.

Hermann W. Merkel, Chief Constructor and Forester.

C. William Beebe, Curator of Birds.

Raymond L. Ditmars, Curator of Reptiles.

George M. Beerbower, Civil Engineer.

E. R. Sanborn, Photographer and Editor.

William I. Mitchell, Office Assistant.

E. H. Costain, Captain-of-the-Watch and Assistant Forester.

One phase of the business relations between the city government and the Zoological Society merits especial notice; and it may well be considered outside of New York as a lesson in material progress.

In nearly every city of the world, the up-building of important institutions either wholly or partly paid for from public funds, is so hedged about with safeguards and checks upon possible dishonesty that oftentimes the rate of progress is distressingly slow.

During the administration of Mayor Van Wyck, Comptroller Coler and Park Commissioner Moebius, it was decided that in the making of "miscellaneous ground improvements,"—a heading which has embraced a-thousand-and-one undertakings of a nature almost impossible to "specify" in advance, and put into contracts,—it was decided that the Zoological Society should have the utmost liberty permissible under the law. As a result, we have been enabled to make *double the progress* with far less expenditure of money, and with 50% better results, than would have been possible under a rigid adherence to the contract system. The work done by men selected solely on their ability and merits, and directed day by day by our own officers, has been the salvation of the Zoological Park; but it was possible only because the city government had faith in the business ability and

integrity of the Board of Managers of the Society.

All the animals of the Zoological Park are the property of the Zoological Society, either having been presented by its members, or purchased out of the profits of the privilege business created by the Society through Mr. Mitchell, under our contract with the City. The statistics of the collection have been published elsewhere in this BULLETIN.

Now that the Zoological Park is practically complete, the Society must take up more vigorous and extensive work in the field of wild-life protection, and the promotion of zoology. Much important work lies in sight, demanding attention. Nothing short of an endowment fund of \$1,000,000 will enable the Society to do its whole duty in the two fields that it has as yet been unable to enter vigorously. The duty of all zoologists and nature-lovers to the cause of wild-life protection is conceded by all intelligent men, and requires no demonstration save practical work in the vineyard. The Society desires to devote six thousand dollars a year to wild-life protection; and it is well known that our fast vanishing wild life needs the effort.

But let it not be supposed that during the past twelve years the Society has ignored this cause. On the contrary, ever since 1897 the Secretary and the Director of the Park have put forth a continuous series of efforts, covering game fields in need of work in Newfoundland, Alaska, British Columbia, Mexico, Montana, Wyoming and New York. It would be possible to enumerate several important results achieved in those fields through the efforts of the Society and its officers.

Because of the Zoological Society's satisfactory business methods in connection with the Zoological Park, the City Department of Parks, in 1902, requested the Society to assume control of the New York Aquarium, and place it upon a permanent scientific basis. The growth and the character of that institution today are testimonials to the wisdom of the actions which placed it upon a permanent basis, and selected Charles H. Townsend as its Director.

On November 9th, the Zoological Society will enter upon a new period of its history. The completion of the Administration Building, just ten years to a day from the opening of the Park, practically ends the period of strenuous construction, and opens up new fields of labor. With the aid of the endowment fund that the Society has a right to expect, important results may be achieved in the protection of wild life and the diffusion of useful zoological knowledge.



THE CONCOURSE AND NORTH END OF BAIRD COURT.
Administration Building on the left, Italian Garden in Centre, Bird-House on the right, Primate's House in the distance.



THE HERD ON ITS RANGE.

THE WICHITA NATIONAL BISON HERD.

PRESENTED TO THE NATION BY THE NEW YORK ZOOLOGICAL SOCIETY.

It seems strange that the East should undertake the task of restoring to a permanent basis in the West an important wild-animal species that was destroyed by the men of the West.

Greed and blood-lust is not, like the tariff, a local issue. It is thoroughly cosmopolitan. Wherever there is found an abundance of wild-animal life, there will be found also the buzzards of commerce destroying life and "wrecking" carcasses. It was the men of the West who got up the wild and bloody orgy of the buffalo plains, and left behind them only foul carcasses, poisoned air and desolation.

Strange to say, however, the West has shown little more than a bystander's interest in the effort now being made to establish the American Bison species on national ranges with such a degree of permanency that it will endure for the centuries of the future. Most of the appeals of the Bison Society for contributions from beyond the head of the Ohio River have fallen on deaf ears and tightly-closed purses. The West as a whole has yet to learn what it is to give dollars for the preservation of wild life; but the record of Wyoming and Colorado in feeding starving Elk, last winter, constitutes a fine exception.

For many years, various individuals have urged Congress to "do something" for the Bison. I think it was the efforts of Col. "Buffalo"

Jones, of Kansas, that finally resulted in the establishing of a national Bison herd in the Yellowstone Park. It cost a mighty effort, backed by the Biological Survey, to secure through that grand champion of wild life, Congressman John F. Lacey, of Iowa, the sum of \$10,000 for that nucleus.

Later on, the New York Zoological Society conceived the idea of a corporate sacrifice in behalf of the Bison, and proposed to the government a partnership arrangement for the founding of a new herd. The Society offered a nucleus herd of 15 pure-blood Bison as a gift, delivered on the ground, provided the National Government would set aside 12 square miles of fine grazing grounds, on what once was the range of the great southern herd, fence it in, and permanently maintain the herd.

The offer was promptly and graciously accepted, the money involved was immediately voted, and the fence was erected in a very satisfactory manner. Without any unnecessary delay, the Zoological Society selected 15 of the finest Bison in the Zoological Park herd, and with most generous aid from the American and Wells-Fargo Express Companies (who carried the herd free of all cost), the gift was delivered at the southern boundary of the Wichita National Forest and Game Preserve in southwestern Oklahoma.



THE ROCKY MOUNTAIN GOAT IN NEW YORK.

In view of the peculiar difficulties and impossibilities surrounding all attempts to induce our mountain sheep, caribou and moose to live on the Atlantic Coast, the successful acclimatization of a herd of Rocky Mountain Goats in the Zoological Park becomes of special interest.

In October, 1905, five kids, then about five months old, were personally conducted from Fort Steele, British Columbia, to New York, and established in and about the rustic Goat House in the southwestern corner of the Park. The flock contained three males and two females,—all of which elected to live and thrive. They were given two well-shaded yards paved with macadam, a brushy hillside of dry earth, and the roof of the barn to clamber over. It was quickly discovered that in this low altitude, the Mountain Goat can not endure rain, especially in winter; and it has been our fixed policy to house the herd whenever a rain-storm appears.

On May 20, 1909, one of the females gave birth to a lusty male kid, which she successfully

reared. Her offspring is now so large, so vigorous and so free with his horns, it has been necessary to saw off the skewer-like tips of his horns for the general safety of the other members of the herd. Little "Philip" is apparently quite as large and vigorous as any wild male goatlet of similar age.

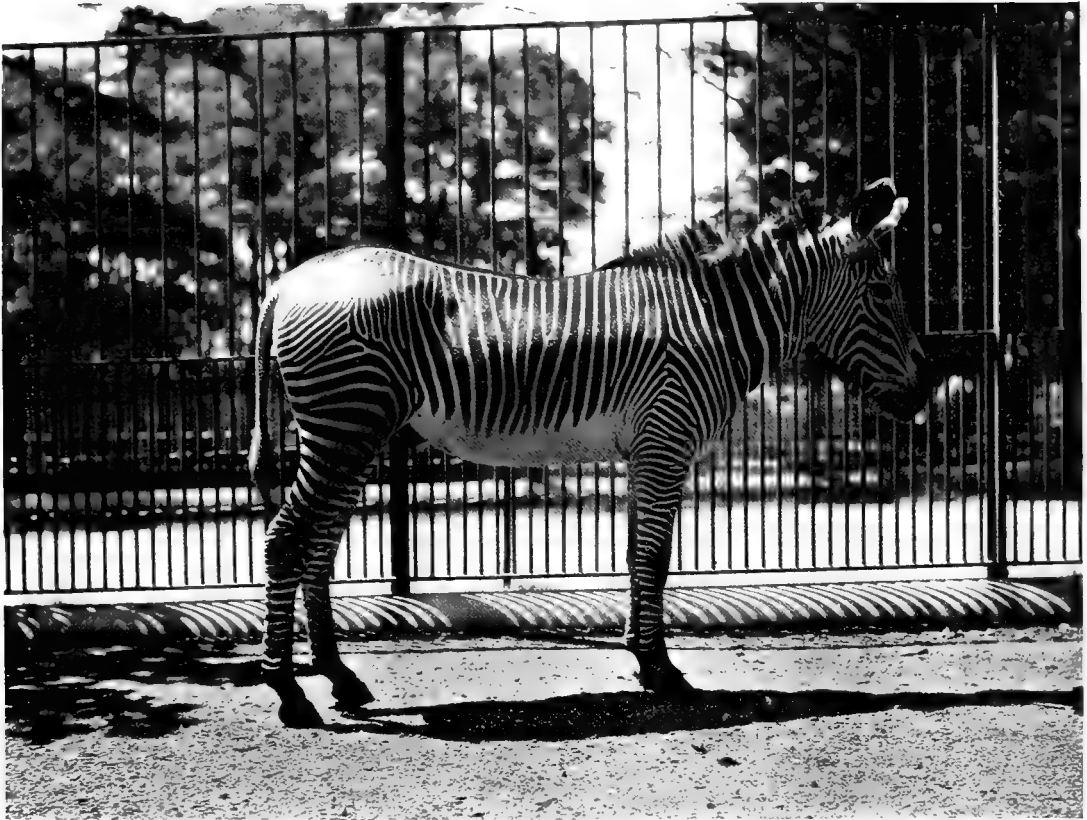
Unfortunately for the mother, her maternity effort at this altitude was fatal to her. After nursing her offspring to weaning-time, she died of what was really a general exhaustion of her vitality.

The four original members of the herd remain in perfect health, but the other female has not yet bred. They continue to be shy of the human hand, and although they will approach almost within reach, they will not permit anyone to handle them, not even their keeper.

The illustration above shows one of the males with his long, shaggy winter coat not yet fully developed.



A BIT OF LAKE AGASSIZ FROM THE JUNGLE WALK.



GREVY ZEBRA FROM SOUTHERN ABYSSINIA.

TWO RARE ZEBRAS.

Of all living Zebras, the rarest and the most sought are Grevy's Zebra, from northern Somaliland and Abyssinia, and the Mountain Zebra, from the mountains of Cape Colony. The former is comparatively new to the zoological world, having been discovered and described as late as 1882, when it was named in honor of the president of the French Republic, to whom the type specimen was sent by King Menelik. Of that rare species, Menelik maintains what is well-nigh a close monopoly, and few specimens ever reach the outside world that have not first passed through his hands.

The Grevy Zebra is distinguished by its large size, very narrow stripes that extend quite down to the hoofs, and its large ears.

The Mountain Zebra is a smaller species, marked by very wide stripes on the hindquarters only, and narrow stripes elsewhere. It is found only in the mountains of Cape Colony, and by the game protectors of that colony, its total number is estimated at only 400 individuals.

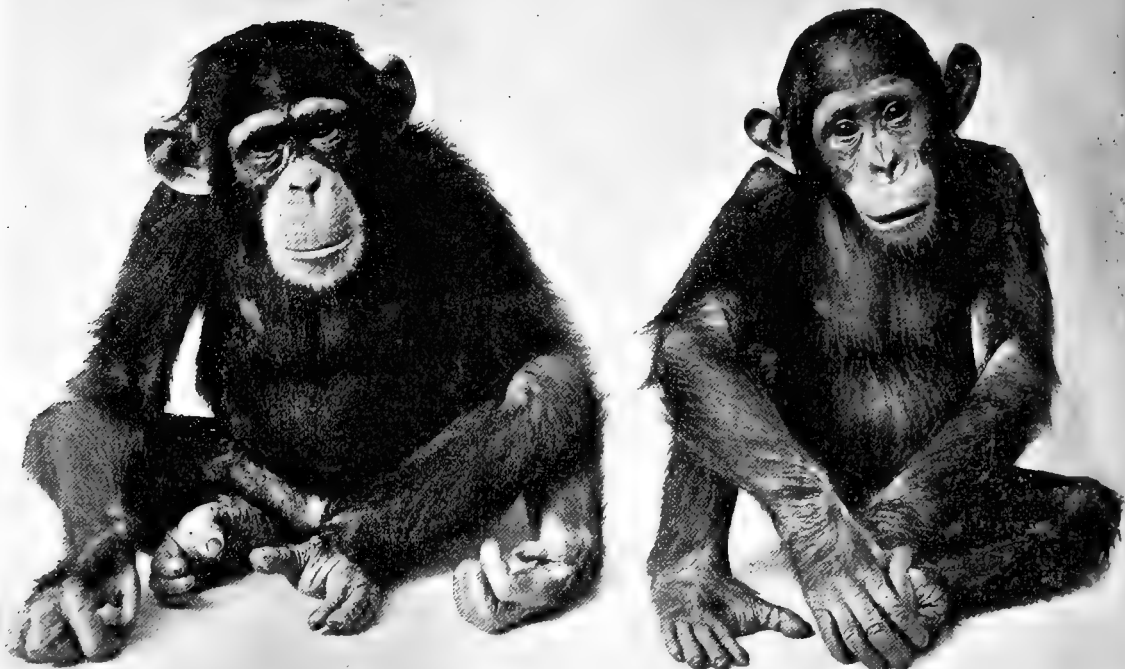
We are fortunate in possessing fine examples of both the species noticed above.

ZOOLOGICAL PARK VISITORS.

In determining the popularity of any public institution, it is the inexorable recording turnstile that tells the story. Being somewhat removed from New York City's center of population every visitor to the Zoological Park represents a special effort, and something expended for car fare. In view of all this, these figures of our monthly attendance for 1908 are of interest:

| | 1908 | Increase. |
|-----------------|---------|-----------|
| January | 42,356 | 2,887 |
| February | 37,804 | 10,224 |
| March | 77,841 | 10,583 |
| April | 118,384 | 27,833 |
| May | 182,192 | 20,706 |
| June | 187,656 | 19,622 |
| July | 159,797 | |
| August | 190,813 | 160 |
| September | 153,007 | 26,487 |
| October | 120,952 | 30,239 |
| November | 91,642 | 26,463 |
| December | 51,299 | |

| | | |
|-------------------------|-----------|---------|
| Total for the year..... | 1,413,743 | 175,204 |
|-------------------------|-----------|---------|



LONG-HAIRED CHIMPANZEE "AUGUST" AND BALD-HEADED CHIMPANZEE "BALDY."
Pan satyrus schweinfurthi (Giglioli) *Pan pygmaeus* (Schreiber)
 Sudan and Uganda. Equatorial West Africa.

HOW TO REACH THE ZOOLOGICAL PARK.

For ten years, many of the newspapers of New York have constantly endeavored to inform their readers that the Zoological Park is *in the Bronx!* The energy and persistence with which we are Bronxed, year in and year out, is worthy of a real public necessity. If there were in New York City an assortment of zoological parks, then would we cheerfully accept "Bronx" as a part of our name; but there is only one Zoological Park hereabouts, and Jonas Bronck never dreamed of founding it.

The Zoological Park ("*in the Bronx*") is most easily reached by the eastern branch of the Subway. To-day the trains are marked "Bronx Park" and "West Farms;" but we are informed that in a short time our trains will be marked "Zoological Park." To reach the center of the Zoological Park from Wall Street requires about 55 minutes, and from the Grand Central Station about 40 minutes. The Subway terminus is at 180th Street, only two short blocks from our Boston Road Entrance, and the Boat House.

Visitors coming up on the Third Avenue Elevated should alight at Fordham Station, and either walk or take a surface car eastward on Pelham Avenue for nearly half a mile. The Interborough cross-town lines on 180th Street, and also on 189th Street, land visitors near our two western entrances.

CARRIAGES AND AUTOMOBILES.—The route from lower New York for carriages and automobiles is through Central Park, Lenox Avenue, Macomb's Dam Bridge, and Jerome or Washington Avenues to Pelham Avenue, thence eastward to our new Concourse Entrance, at the Bronx River bridge. Vehicles with visitors may enter the Park at that point, and land them at the steps leading up to Baird Court.

PAY DAYS AND FREE DAYS.—The Park is free on all days of the week save *Mondays* and *Thursdays*. On those two pay-days an admission of 25c. for adults is charged to all persons who are not members of the Society.

The Official Guide to the Zoological Park, fully illustrated, can be obtained at all entrances, for 25 cents.



PENINSULA BEAR CAPTURED AT MOELLER BAY, ALASKA PENINSULA.

A GREAT COLLECTION OF BEARS.

If properly established, no captive wild animals more fully repay their cost and keep than a collection of bears that has been judiciously formed. It is true that they are very troublesome comforts, and that every big bear is a storm-center; but we like them, for all that. When comfortably installed in large, clean yards, with plenty of sunlight, fresh water, rocks to climb upon and a good variety of food, they are full of action, and constitute a great attraction to visitors.

From the beginning, we have striven to bring together as many as possible of the species of bears with which the public is but little acquainted. First we devoted special attention to the Alaskan Brown Bears,—the giants of the genus *Ursus*,—and to-day we have four good species, with the prospect of a fifth one when a certain young animal matures. One of these has come to us from north of the Arctic Circle, only 300 miles south of Point Barrow (the most northerly point of Alaska), which is the most northerly habitat for a bear of this group.

We have also recently secured,—after ten years of constant effort,—a black bear from South America, which represents the form described by Oldfield Thomas as *Ursus ornatus majori*. Of our old friend, the Rocky Mountain Grizzly, we have specimens from several different localities.

The following is a list of our specimens and species, as the collection stands to-day:

| | |
|--|---------------------------|
| 2 Polar Bears..... | <i>Ursus maritimus</i> . |
| 2 Kadiak Bears..... | " <i>middendorffi</i> . |
| 2 Yakutat Bears..... | " <i>dalli</i> . |
| 1 Admiralty Bear..... | " <i>eulophus</i> . |
| 1 Peninsula Bear..... | " <i>merriami</i> . |
| 1 Arctic Brown Bear..... | " undetermined. |
| 3 Grizzly Bears..... | " <i>horribilis</i> . |
| 9 Black Bears..... | " <i>americanus</i> . |
| 1 Syrian Bear..... | " <i>syriacus</i> . |
| 2 Brown Bears..... | " <i>arctos</i> . |
| 2 Hairy-Eared Bears..... | " <i>piscator</i> . |
| 1 Himalayan Black Bear..... | " <i>torquatus</i> . |
| 1 Japanese Bear..... | " <i>japonicus</i> . |
| 2 Yezo Bears..... | " <i>ferox</i> . |
| 1 Sloth Bear..... | " <i>labiatus</i> . |
| 2 Sun Bears..... | " <i>malayanus</i> . |
| 1 Andes Black Bear..... | " <i>ornatus majori</i> . |
| 3 Hybrids, born here. | |
| 37 specimens, representing 17 species. | |



NORTH FACADE AND DOME OF THE ELEPHANT HOUSE.
Heins & La Farge, Architects.

THE ELEPHANT HOUSE.

OF the building operations in the Zoological Park, the most important single feature is the Elephant House. Of ten years construction work, it is the climax; and it is fittingly crowned with a dome. It is situated on the site prepared for it by Nature, and chosen twelve years ago, on the axis of Baird Court, and in the open space midway between the Court and the Wolf Dens. In effect, it connects the two great groups of installations of the northern and southern regions of the Park which until now have been slightly separated.

We believe that this effort represents high-water mark in zoological building construction. It is spacious, well lighted, beautiful in its lines, both externally and internally, beautifully ornamented without being overdone, and also wholly free from useless extravagance. The interior lighting and cage "effects" are highly satisfactory, the light upon the animals being quite sufficient, without being too strong and glaring. It is clearly evident that the animals *enjoy* their cages; for were it otherwise, the African rhinoceros would not, almost daily, gallop round and round, and with ponderous agility often leap into the air.

In several important particulars the Elephant House is unlike all other buildings in the Park. It is high; it is entered at the center of each side, instead of at each end; it is built entirely of stone; it has a main roof of green tiles, and has a lofty dome covered with glazed tiles laid in an elaborate color pattern of browns and greens. The dome is finally surmounted by a "lantern" of elaborate tile work, also in colors. Excepting the dome, the whole exterior structure is of smoothly dressed Indiana limestone. Each entrance consists of a lofty and dignified archway, in which the doors are deeply recessed; and each of these arches is grandly ornamented by animal heads, sculptured in stone.

The color effects of the interior are particularly pleasing. The large, flat bricks of the Gustavino arch system are in their natural colors, and form a blending of soft brown and buff shades that not only avoids monotony, but is pleasing and restful to the eye. Combined with the vaulted ceilings of the main halls and the cages there are a few strong arches of mottled buff brick which harmonize perfectly with the ceiling tiles of the main dome. This scheme of vaulted ceilings is so new that few persons ever have seen a finished example. Both the main dome, and the arched ceiling below it, have been

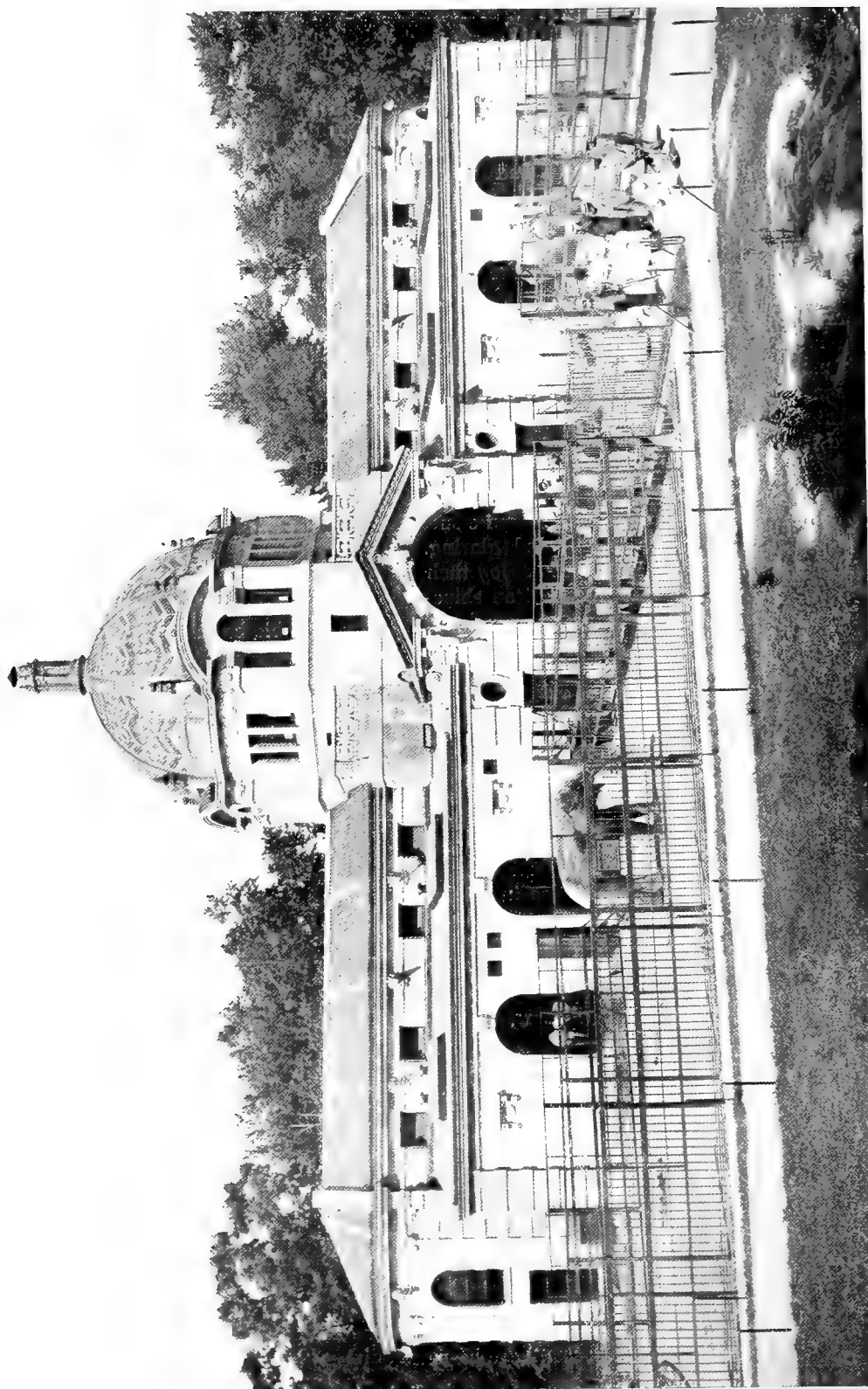
constructed by Gustavino without the employment of either the steel rafters or ribs which one naturally expects to see in such structures.

Each of the eight immense cages, that to-day contain elephants and rhinoceroses, has been designed to frame and display its living occupant as perfectly as a frame fits a picture. The vaulted ceilings and large central skylights are particularly well adapted to cages for extra large animals, and the lighting is quite perfect. The front of each cage—24 feet—is spanned aloft by a single Gustavino arch, and is unspoiled by intermediate columns. Each cage is 24 x 24 feet, which is ample for elephants and rhinoceroses of the largest size. To a height of 6 feet the walls are lined with plates of quarter-inch steel; and nothing less powerful than a locomotive could break through or break down the front bars and beams. The outside doors are marvels of strength and smoothness in action. They are of four-inch oak, reinforced with quarter-inch steel plates, and on the inside they are strengthened against attack by three heavy movable beams of steel.

The ground plan, and all cage and yard arrangements of the Elephant House, were designed by the Director of the Zoological Park. The architects were Messrs. Heins & La Farge. The animal sculptures on the southern half of the building were executed by A. Phimister Proctor, and those on the north half are by Charles R. Knight. The building was erected by the F. T. Nesbit Company, with John C. Coffey as Superintendent of Construction. The steel fences enclosing the yards were designed by George M. Beerbower, Civil Engineer of the Zoological Park staff, and the macadam and masonry construction work in the yards and surrounding walks was performed by our own force, under the direction of Hermann W. Merkel, Chief Constructor.

The total cost of the building was \$157,473, and of the surrounding yards, fences and walks \$27,159, making for the entire installation a total of \$184,632. This is \$16,000 less than the original estimate.

The Elephant House contains a surpassingly fine and valuable collection, consisting of 2 Indian Elephants, 2 Sudan African Elephants, 1 Congo African Elephant, 1 Great Indian Rhinoceros, 2 African Black Rhinoceroses, 1 Hippopotamus, 2 American Tapirs and 1 Indian Tapir.



THE ELEPHANT HOUSE AND ITS YARDS.



INDIAN ELEPHANT "GUNDA" IN HIS NEW QUARTERS AT THE ELEPHANT HOUSE



MALE HIPPOPOTAMUS.



JAPANESE RED-FACED MONKEY AND YOUNG.



YOUNG MEXICAN PUMA.

IMPORTANT ACCESSIONS FROM AFRICA IN 1909.

| | | |
|---------------------|--------------------------|--------------------------|
| 1 SABLE ANTELOPE. | 1 WART-HOG. | 2 BLACK-FOOTED PENGUINS. |
| 1 GREATER KUDU. | 1 HYAENA DOG. | 4 EGYPTIAN GEESE. |
| 1 MOUNTAIN ZEBRA. | 2 BLACK-BACKED JACKALS. | 2 BATELEUR EAGLES. |
| 2 GRANT ZEBRAS. | 1 CARACAL. | 2 VULTURINE SEA EAGLES. |
| 1 CONGAN SITATUNGA. | 1 CHEETAH. | 2 TOURACOUS. |
| 2 SPEKE SITATUNGAS. | 1 HYRAX. | 1 GOLDEN ORIOLE. |
| 1 DUKER ANTELOPE. | 1 BROAD-NOSED CROCODILE. | 1 ROCK THRUSH. |



TAMANDUA: PREHENSILE-TAILED ANTEATER.



TREE PORCUPINE.

LIST OF INSTITUTIONS HOLDING EXHIBITIONS

UNDER THE AUSPICES OF OR IN COOPERATION WITH SCIENTIFIC, HISTORICAL AND
ART COMMITTEES OF THE HUDSON-FULTON CELEBRATION COMMISSION

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, Engineering Building, 29 West Thirty-ninth Street. Robert Fulton Exhibition. Consists of paintings, drawings, books, decorations and furniture, and working models of John Fitch's steamboat, the first boat operated and propelled by steam; Robert Fulton's "Clermont," the first successful application of steam to navigation, and John Stevens' "Phœnix," the first steamboat to sail on the ocean.

The exhibition will be shown in the Council Room of the Society, on the eleventh floor, and will be open from 9.00 a. m. until 5.30 p. m. during the entire period of the Hudson-Fulton Celebration, and from 9.00 a. m. until 5.00 p. m. daily until December 6th.

CITY HISTORY CLUB OF NEW YORK, 21 West Forty-fourth Street. Special Exhibition of Illustrations, Photographs, Maps and Plans, relating to the history of the City of New York, and all of the originals used in the City History Club Historical Guide Book of the City of New York.

COLLEGE OF THE CITY OF NEW YORK, St. Nicholas Avenue and 139th Street. Hudson-Fulton Exhibit. During the Hudson-Fulton Celebration and for some weeks thereafter, the College of the City of New York will have on exhibition in its historical museum a collection of charts, views, manuscripts and relics representing old New York. Among the charts will be original prints of New Netherlands and New Amsterdam by Nicholas J. Vischer, about 1650; N. Visscher, 1690; Lotter's "New Jorck," 1720; contemporary plans and views of the Revolutionary period showing the movements of Washington and Howe in this vicinity during the Campaign of 1776; Revolutionary battle relics; portraits, residences and letters of old New Yorkers; bronze busts of Washington, Lincoln and Fulton by Houdon and Volk; and other material suggested by the celebration.

Take Sixth Avenue Elevated Railway to 140th Street, or Broadway Subway to One Hundred and Thirty-seventh Street; also Amsterdam Avenue surface cars to college entrance.

DEPARTMENT OF PARKS, BOROUGH OF BROOKLYN. Through the courtesy of Commissioner Michael J. Kennedy and his assistant arboriculturist, J. J. Levison, the different species of trees have been labeled in Prospect Park, from the Plaza to the Willink Entrance; in Bedford Park; in Highland Park, and in Tompkins Park. An additional small enameled sign has been hung on those labeled trees that were indigenous to the Hudson River Valley in 1609. The special label reads: "This species is a native of the Hudson River Valley."

FRAUNCES TAVERN, 54 Pearl Street, near Broad Street. Historic Revolutionary Building. Built in 1719. Scene of Washington's farewell to his officers on December 4th, 1783. Restored December 4th, 1907, by the New York Society of the Sons of the Revolution. Open daily, except Sundays, from 9 a. m. to 6 p. m. Special Exhibition of Revolutionary Relics by the New York State Society of the Sons of the Revolution, who are the owners of that historical building, September 15th to November 1st.

Take Subway to Bowling Green Station, or Third Avenue Elevated Railway to Hanover Square Station, or Broadway surface cars.

LONG ISLAND HISTORICAL SOCIETY, corner of Pierrepont and Clinton Streets, Brooklyn, between Brooklyn Bridge and Borough Hall. Open daily, except Sundays, from 8.30 a. m. to 6 p. m. Reference library of 70,000 volumes; manuscripts, relics, etc. Autograph receipt of Robert Fulton and original manuscript volume of Danker's and Sluyter's "Journal of a Voyage to New York in 1679-80."

Take Subway to Borough Hall, Brooklyn; Third Avenue Elevated Railway to Brooklyn Bridge, connecting with Bridge cars; or surface cars to Bridge.

METROPOLITAN MUSEUM OF ART, Central Park East. Main entrance on Fifth Avenue at Eighty-second Street. Open daily, except Sundays, from 10.00 a. m. to 6.00 p. m.; in winter to 5.00 p. m.; Saturdays to 10.00 p. m.; Sundays from 1.00 to 6.00 p. m. On Mondays and Fridays an admission fee of 25 cents is charged, except to members and copyists. Collections illustrating all departments of Art and Archæology. Special Exhibition of a magnificent Collection of over 130 of the works of Old Dutch Masters, constituting the finest Exhibition of this kind ever made. Products of Colonial Art: Industrial Art, Furniture, Pewter of the 17th and 18th centuries, etc. (Two illustrated catalogues for sale, one of Dutch Exhibit and one of Colonial Arts; price 10 cents each. Also finely illustrated edition de luxe.)

Take Fifth Avenue stages or Madison Avenue surface cars to Eighty-second Street, one block east of Museum; connection with Subway at Forty-second Street, and with Elevated Railway and West Side surface cars at Fifty-ninth Street.

NATIONAL ARTS CLUB, Twentieth Street near Irving Place (Gramercy Park). This house was formerly the residence of Samuel J. Tilden, and is situated one block east of the birth-place of Ex-President Roosevelt. Open daily from September 20th to about October 18th, 1909, from 9 a. m. to 10 p. m. Special Loan Exhibition by the National Arts Club, in cooperation with the American Scenic and Historic Preservation Society.

Three centuries of New York City: Special Exhibition of Paintings, Photographs, Drawings and other interesting materials, illustrating the growth and progress of New York from the time of Henry Hudson to the present day. (Catalogue for sale.)

Take Fourth or Madison Avenue surface cars to corner of Fourth Avenue and Twentieth Street, one block west of Club-house. Subway Station at Eighteenth Street and Fourth Avenue, three blocks away.

NEW YORK BOTANICAL GARDEN, Bronx Park. Museums open daily including Sundays from 10 a. m. to 5 p. m.; Conservatories from 10 a. m. to 4 p. m. Grounds always open. In the Grounds and Conservatories exhibits of Plants, Shrubs, Trees, and Natural Woodland; in the Museums, Plant Products utilized in the Arts, Sciences and Industries. All plants growing on Manhattan Island and Hudson River Valley at the time of Hudson's arrival are marked with the letter "H." (Special illustrated catalogue for sale.)

Take Third Avenue Elevated Railway to Bronx Park (Botanical Garden). Subway passengers change at 149th Street; also reached by Harlem Division of the New York Central Railroad from Grand Central Station, Fourth Avenue and Forty-second Street.

NEW YORK GENEALOGICAL AND BIOGRAPHICAL SOCIETY, 226 West Fifty-eighth Street, between Broadway and Seventh Avenue. Open daily, except Sundays, from 10.00 a. m. to 5.00 p. m., until November 1st. Special Exhibition of old Deeds, Manuscripts, Books, Portraits, etc., relating to the history of the United States up to and including the War of 1812. (Catalogue for sale.)

Take Broadway surface cars to corner of Fifty-eighth Street. Subway station at Columbus Circle (Fifty-ninth Street), two blocks distant; Sixth Avenue Elevated station at Ninth Avenue and Fifty-ninth Street, three blocks away.

NEW YORK HISTORICAL SOCIETY, corner of Seventy-seventh Street and Central Park West. September 25th to October 30th, open daily from 9 a. m. to 5 p. m. Robert Fulton Exhibition, of the New York Historical Society, in cooperation with the Colonial Dames of America. (Catalogue for sale.)

Take Sixth Avenue Elevated Railway to Eighty-first Street and Columbus Avenue, or surface cars traversing Central Park West; also reached by any Columbus Avenue surface car to Seventy-seventh Street.

NEW YORK PUBLIC LIBRARY, Lenox Branch, Fifth Avenue and Seventy-second Street. Open daily, except Sundays, from 9 a. m. to 6 p. m. Special Exhibition of Prints, Books, Manuscripts, etc., relating to Henry Hudson, the Hudson River, Robert Fulton, and Steam Navigation. (Special illustrated catalogue for sale; price 10 cents.)

Take Fifth Avenue Stages, or Madison Avenue surface cars to Seventy-second Street, one block east of Library; connection with Subway at Grand Central Station and with Elevated Railway and West Side surface cars at Fifty-ninth Street.

REFORMED DUTCH CHURCH. The Reformed Protestant Dutch Church of the City of New York will make an exhibit in the chapel of the Church of St. Nicholas, Fifth Avenue and 48th Street, during the week of the celebration, 9 to 5 daily.

This church was organized A. D. 1628, and the exhibit will comprise articles connected with its long history.

VAN CORTLANDT HOUSE MUSEUM, in Van Cortlandt Park. This fine colonial mansion, built in 1748, with furniture of period, is one of the oldest houses within the area of Greater New York; it is in the custody of the Colonial Dames of the State of New York. Open daily, 9.00 a. m. to 5.00 p. m. Special Exhibition of Mezzotint Portraits of men prominent in political life prior to the Revolution; Wedgwood's Medallion Portraits of Illustrious Personages; Cartoons and Caricatures of political events, etc. (Special illustrated catalogue on sale.)

Take New York Central Railroad from Grand Central Station; Sixth Avenue Elevated Railway, connecting at 155th Street with the Putnam Division of the New York Central Railroad; or Subway trains marked Van Cortlandt Park.

WASHINGTON'S HEADQUARTERS (The Jumel Mansion), Roger Morris Park, Edgecombe Avenue and One Hundred and Sixty-second Street. Built about 1760. Under the Department of Parks. Exhibition by the ladies of the Washington Headquarters Association, Daughters of the American Revolution. Open free daily, including Sundays, from 9 a. m. to 5 p. m. Special features: Collection of Colonial furnishings, objects and pictures; also the Bolton Collection of War Relics of the Revolution.

Take Amsterdam Avenue surface cars; Sixth Avenue Elevated Railway to One Hundred and Fifty-fifth Street, or Broadway Subway to One Hundred and Fifty-seventh Street.

ZOOLOGICAL INSTITUTIONS OF NEW YORK

HOLDING EXHIBITIONS UNDER THE AUSPICES OF OR IN COOPERATION WITH SCIENTIFIC, HISTORICAL AND ART
COMMITTEES OF THE HUDSON-FULTON CELEBRATION COMMISSION

AMERICAN MUSEUM OF NATURAL HISTORY, Seventy-seventh Street, from Columbus Avenue to Central Park West. Open daily, except Sundays, from 9 a. m. to 5 p. m. Sundays from 1 to 5 p. m. Always free. Special Exhibition during the Hudson-Fulton Celebration, from September 1st to December 1st. Original objects showing the life and habits of the Indians of Manhattan Island and the Hudson River Valley. (Special illustrated catalogue for sale, price 10 cents.)

Take Sixth or Ninth Avenue Elevated Railway to Eighty-first Street, or Subway to Seventy-ninth Street; also reached by all surface cars running through Columbus Avenue or Central Park West.

BROOKLYN INSTITUTE, Eastern Parkway. Open daily, except Sundays, from 9 a. m. to 6 p. m.; Sundays from 2 to 6 p. m. Thursday evenings from 7.30 to 9.30 p. m. Free except on Mondays and Tuesdays when admission fee is charged of 25 cents for adults and 10 cents for children under six years of age. Collection illustrating various departments of Archæology, Mineralogy and Ethnography. Special Exhibition relating to past and present life of Indians on Long Island. Portrait of Robert Fulton painted by himself, the property of Col. Henry T. Chapman and loaned by him to the Museum. Open September 1st to December 31st. (Illustrated catalogue for sale.)

Take Subway Express to Atlantic Avenue, or Flatbush Avenue Trolley from Brooklyn Bridge. St. John's Place surface car from Atlantic Avenue or Borough Hall.

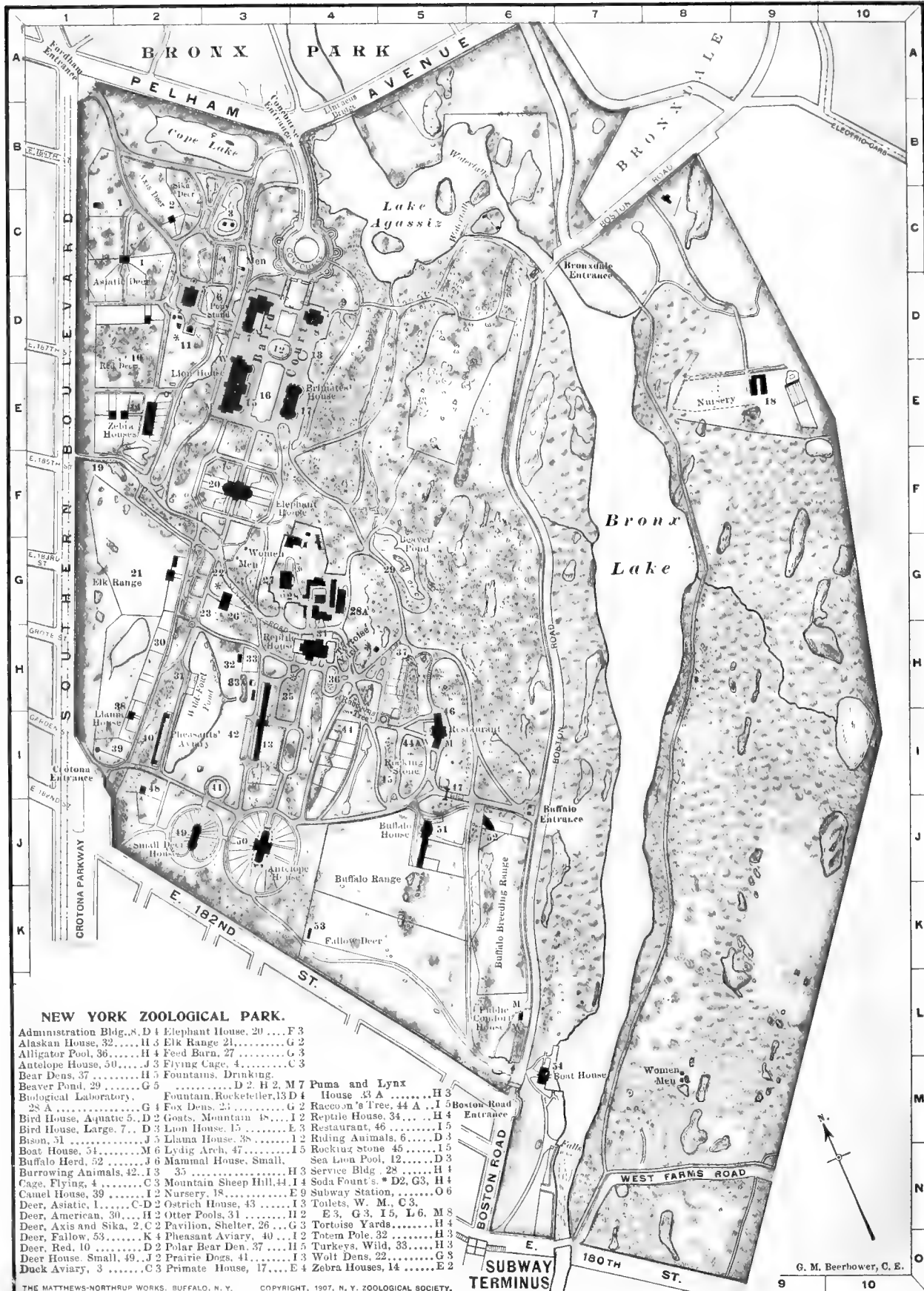
CHILDREN'S MUSEUM (Brooklyn Institute), Bedford Park, Brooklyn Avenue. Collection illustrative of the fauna of Long Island. Open free to the public from Monday to Saturday (inclusive) from 9 a. m. to 5.30 p. m., and on Sunday from 2 until 5.30 p. m.

NEW YORK AQUARIUM, in Battery Park, under the management of the New York Zoological Society. Open daily, including Sundays, from 9 a. m. to 5 p. m. until October 15th. (October 16th to April 14th, from 10 a. m. to 4 p. m.) This building was erected in 1807 by the United States Government as a fort and after the War of 1812 was called Castle Clinton; later, as Castle Garden, it was the scene of Jenny Lind's triumphs, and from 1855 to 1890 it was the portal of the New World for 7,690,606 immigrants. This is the largest aquarium in the world and contains a greater number of specimens and species than any other. All tanks containing fish indigenous to the Hudson River will be so marked.

Take Elevated Railway to Battery Place Station, or Subway to Bowling Green Station; also reached by all surface cars which go to South Ferry.

NEW YORK ZOOLOGICAL PARK, under the management of the New York Zoological Society, in Bronx Park. Open daily, including Sundays, from 9 a. m. until an hour before sunset (November 1 to May 1 from 10 a. m.). Free, except on Mondays and Thursdays, when an admission fee of 25 cents is charged. Exhibition of a splendid collection of Animals, Birds and Reptiles. The fauna of Henry Hudson's time on Manhattan Island and in the Hudson River Valley will be indicated by the flag of the Hudson-Fulton Celebration. (Special illustrated catalogue describing same for sale.)

Take Subway trains marked "Bronx Park Express" to terminus at 180th Street, or Third Avenue Elevated to Fordham Station. The entrances are reached by numerous surface cars.



THE NEW YORK ZOOLOGICAL PARK IN 1909
 LATEST OFFICIAL MAP

ZOOLOGICAL SOCIETY BULLETIN

No. 36

Published by the New York Zoological Society

October, 1909

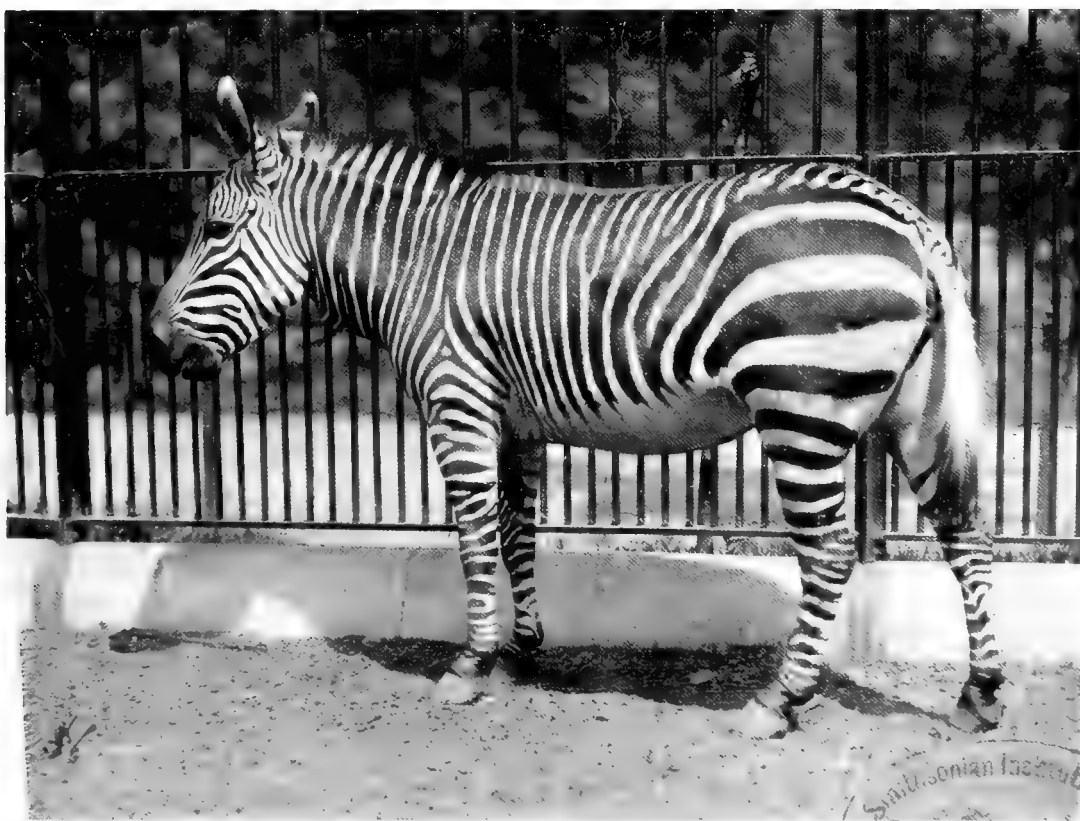
REPORT ON EUROPEAN TRIP.

By RAYMOND L. DITMARS.

WITH a special fund of two thousand dollars for the purchase of mammals, birds and reptiles, the writer left New York on the 8th of last May, for a tour of the Zoological Gardens of England, Holland, Belgium, France and Germany, and an inspection of the animal markets in those countries. Besides the fund for the purchase of animals, needed for our collections, the writer took with him a large series of reptiles to be used in exchange with the Zoological Gardens of London, in obtaining similar specimens for the Park. The east-bound passage was made on the S. S. "Minnetonka" of the Atlantic-Transport Line. A trans-shipment

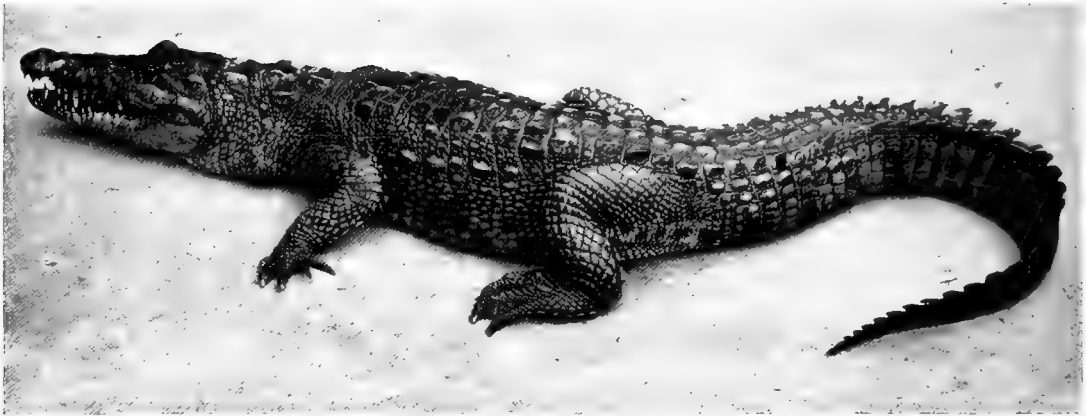
from the Red D Line steamer "Philadelphia" from Venezuela, which lot was made up of mammals and birds collected and donated to the London Zoological Gardens by Captain Albert Pam was taken charge of by the writer, when the collection arrived in New York and cared for together with his shipment of reptiles. The writer arrived in London without losses during the voyage.

The animal market in England during the spring and early summer of 1909 was the poorest in some years. A thorough canvass of all the shops in London, Southampton, Plymouth and Liverpool, resulted in but few purchases of



MOUNTAIN ZEBRA; FEMALE.

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NH



SALT-MARSH CROCODILE.

mammals, although a fair series of reptiles was obtained. A month later, after returning from the Continent, the writer found conditions somewhat improved, and two weeks steady work, spent among the animal shops of London and Liverpool, and watching the arrival of incoming vessels, from the Indian and African ports, resulted in an interesting series of purchases. A very large and valuable collection of reptiles was gathered.

On the Continent the conditions were much the same. There was a marked scarcity of primates and miscellaneous small mammals. A large series of important and showy reptiles was purchased of Hagenbeck, at Stellingen, (Hamburg). At the model menageries of Ruhe and of Reiche, at Alfeld on the Leine, some rare hoofed animals were collected, among these being a Mountain Zebra, *Equus zebra*; a fine male example of the Greater Kudu, *Strepsiceros capensis*, a pair of Speke's Sitatunga, *Limnotragus spekei*, and a male Bontebok, *Damaliscus pygargus*.

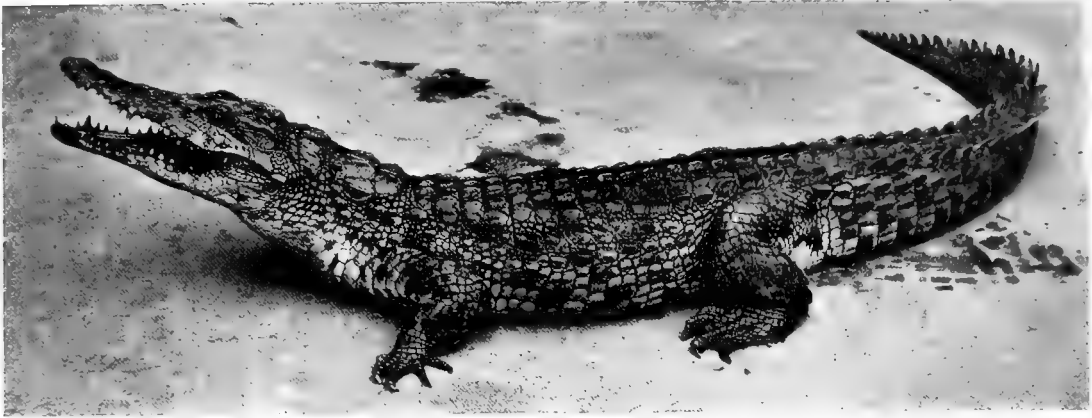
Review of the Animals, Birds and Reptiles Purchased.

The writer's purchases for the Park made a shipment of forty-eight cages, which were placed aboard the Atlantic-Transport, S. S. "Minnehaha," which left London on the 3rd of July. The shipment was made up of over four hundred specimens, representing one hundred and eleven species. For the care of this big, miscellaneous lot of mammals, birds and reptiles, the writer necessarily arranged for a great variety of food to be placed on the steamship and owing to very courteous coöperation on the vessel, he was enabled to so utilize the ship's

refrigerators, that the food remained in perfect condition throughout the passage to the home port; this relating to the meat, fish and soft fruits, during a period of nine days transit. The writer was fortunate in finding aboard the vessel several experienced hostlers returning with stock from the London Horse Show. These men were soon trained to assist him in the cleaning of the cages, although all feeding operations were personally performed by the writer, this work consuming about three hours, daily. While the entire shipment was insured for full value in London, there were no losses during the trip.

Among the mammals brought over is an interesting series of viverrines, including the African Kusimanse, *Crossarchus obscurus*, Suricate, *Suricata tetradactyla*, North African Genet, *Genetta vulgaris*, Small Indian Civet, *Viverra civettina*, Large African Civet, *Viverra civetta*, White-faced Paradoxure, *Paradoxurus musanga*, and the Two-spotted African Palm "Cat," *Nandinia binotata*. All of these species are new to our collection. Among the canines are a pair of Black-Backed Jackals, *Canis mesomelas*, and a Thibet Fox, *Vulpes vulgaris alpinus*, the latter an exceptionally rare and beautiful animal. A pair of almost black, South American Skunks, *Mephitis suffocans*, are among the Carnivores.

The most interesting animal added to the Park collection is a Cape Hyrax, *Hyrax capensis*. Although this animal looks much like the American woodchuck, in fact has all the general outlines and actions of a big rodent, it has long been classed by zoologists among the hoofed animals. It is characterized by the front teeth of the upper jaw, which protrude in tusk-like fashion. Though of chunky build it



NILE CROCODILE.

is an agile climber, and is gifted with a particularly vigorous temper. This animal was purchased from a London dealer, and is the first of its kind to be exhibited in the Zoological Park.

Owing to the scarcity of Primates in the European markets, the writer obtained but few monkeys and lemurs. Among these animals his most important purchases were a Coquerel's Dwarf Lemur, *Microcebus coquereli*, and a pair of Golden Marmosets, *Midas rosalia*. The latter is a beautiful species, covered with long, silky hair, of a uniform golden color. Owing to the hair falling in a mane over the neck and shoulders, the species is sometimes called the Lion Marmoset. This was another species quite new to the Park collection.

A fine series of the larger Egyptian Jerboa, *Dipus aegyptius*, was obtained for the Small Mammal House. These curious rats make a lively exhibit. Two females and a male of the Coypu Rat, *Myocastor coypus*, were also among the rodents. A pair of Vulpine Phalangiers, *Phalangista vulpina*, a pair of Sooty Phalangiers, *P. canina*, Mauge's Dasyure, *Dasyurus viverrinus maugei*, the Common Dasyure, *D. viverrinus*, Bridled Kangaroo, *Onychogale frenata*, and a fine example of the Tasmanian Devil, *Sarcophilus ursinus*, made up the list of marsupials. The latter was included in the material from the Zoological Gardens of London, offered in exchange for a list of reptiles taken over.

In the series of birds brought over are the following: Patagonian Burrowing Owl, *Speotyto cunicularia*, Tawny Owl, *Syrnium aluco*, Bleeding-heart Pigeon, *Phlogoenas luzonica*, Pied Flycatcher, *Muscicapa atricapilla*, Jack-ass Penguin, *Spheniscus demersus*, Varied Hemipode, *Turnix varia*, Satin Bower-bird, *Ptilon-*

orchynchus violaceus, Carrion Crow, *Corvus corone*, Rook, *Corvus frugilegus*. With one or two exceptions these birds formed part of the exchange list from the Zoological Gardens of London.

It was among the reptiles that the most successful and elaborate series of purchases were made. Over fifty species new to the Park are now on exhibition in the Reptile House. For the first time since the opening of the Reptile House, we have a highly interesting series of the poisonous snakes of Australia, which we are exhibiting in a specially constructed case. Three species are exhibited—the Purple Death Adder, or Australian Black Snake, *Pseudechis porphyriacus*, the Gray Death Adder, *Denisonia superba*, and the Tiger Snake, *Brachyaspis curtus*.

Of these the Purple Death Adder is represented by a young male specimen. This is a handsome species, of a lustrous purplish-black, with a row of scarlet scales on each side of the body. There are six specimens of the Gray Death Adder, all fully grown (about five feet long) and looking much like our American "coachwhip snake." The Tiger Snake is represented by two mature specimens, each about twenty-four inches long. This reptile derives its name from the tawny bands that encircle the yellowish body. All of these snakes slightly dilate the neck, when angry, in cobra fashion. They are vicious, highly active and very poisonous. Of the three the Purple Death Adder has the most extensive range, being found over a great part of the Continent of Australia. The Gray Death Adder inhabits Southern Australia and Tasmania. Of the three species the Tiger Snake is particularly interesting. It attains a maximum length of two and one-half feet, is very common in Western Australia and owing to

several phases of its make-up, is thought to represent the ancestral stock (terrestrial) from which sprung the poisonous marine serpents of the East Indies.

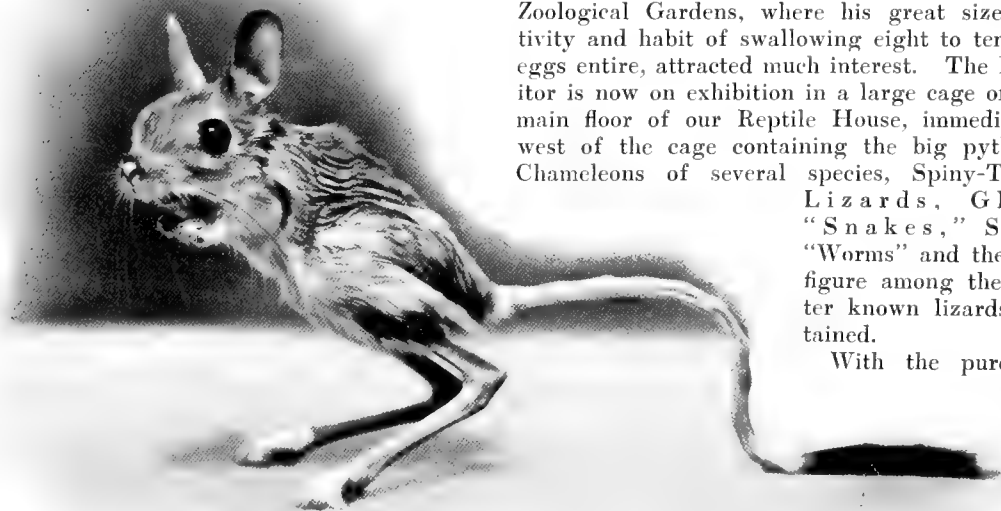
In addition to the exhibit of poisonous Australian serpents, two fine examples of Australian pythons, the Diamond Snake, *Morelia spilotes*, and the Carpet Snake, *Morelia variegata*, were placed in the collection. Of closely allied species, a beautiful young Regal Python, *Python reticulatus*, from Borneo, two specimens of the Congo Python, *P. sebae*, a Madagascar Boa, *Boa madagascariensis*, and a Madagascar Tree Boa, *Corallus madagascariensis*, were added. The latter named species stand as spectacular types of freak distribution. In their structure they are wonderfully like the South American members of the *Boidæ*, which they also resemble in size and coloration. With South America the headquarters of the Boaine snakes, and the tropics of the Eastern Hemisphere, the habitat of the pythons, it seems remarkable that the Island of Madagascar should contain these two species of showy boas, absolutely separated from all allied forms.

A very good series of the harmless serpents of Europe was obtained, which collection has been grouped as one of the features of the Reptile House. The following species of snakes are represented in this series: English Grass

Snake, *Tropidonotus natrix*, Spotted Grass Snake, *T. natrix astrophorus*, Dalmatian Water Snake, *T. natrix murorum*, Tessellated Water Snake, *T. tessellatus*, "Viperine" Water Snake, *T. viperinus*, Dahl's Snake, *Zamenis dahlîi*, Smooth Snake, *Coronella austriaca*, Cat Snake, *Tarbophis vivax*, Leopard Snake, *Coluber leopardinus*, Four-Rayed Snake, *C. quatuorlineatus*, and Aesculapian Coluber, *C. aesculapii*. The latter named species is of great historical interest. In the time of the early Romans it was believed to be the messenger of Aesculapius, the God of Healing. Its appearance was always considered the omen of some gracious action on the part of that particular deity. This belief gained such strength that writers of ancient history record the fact that the Legions carried a number of these sacred reptiles on their great expeditions.

Besides the species of European snakes a full series of the Continental lizards was obtained. The handsomest species among these is the Ocellated Lizard, *Lacerta ocellata*, from southern Europe. The large males are of spectacular coloration—bright green with blotches of rich blue on the sides. The larger examples have a head slightly over two inches in width. Showy lizards of India, Africa and Australia were also added to the collection. The star specimen purchased is a huge Ceylonese Monitor, *Varanus salvator*, over seven feet long and with claws as large as those of a leopard. During the time the writer was finishing his purchases in England, this big lacertilian was placed on exhibition in the Reptile House of the London Zoological Gardens, where his great size, activity and habit of swallowing eight to ten hen eggs entire, attracted much interest. The Monitor is now on exhibition in a large cage on the main floor of our Reptile House, immediately west of the cage containing the big pythons. Chameleons of several species, Spiny-Tailed Lizards, Glass "Snakes," Slow "Worms" and the like figure among the better known lizards obtained.

With the purchase



EGYPTIAN JERBOA.

of an elaborate series of tortoises and turtles, the outside yards of the Reptile House are stocked with the best collection exhibited since the opening of the Park. The most showy of the new chelonians are the Radiated Tortoise, *Testudo radiata*, three specimens from Madagascar, and four specimens of the Leopard Tortoise, *T. pardalis*, from Abyssinia. Over a dozen species, of five genera, are rated among the new aquatic chelonians.



SPINY-TAILED LIZARD.

In the purchase of crocodilians the writer was fortunate in obtaining a half-grown example of the Broad-Headed Crocodile, *Osteolaemus tetraspis*, from Sierra Leone, the bony head of which causes it to be quite characteristic. In addition to this species were a young Nile Crocodile, *Crocodilus niloticus*, a Salt-Marsh Crocodile, *C. porosus*, from Sumatra, and a young example of the Broad-Snouted or Horned Caiman, *Caiman latirostris*, from the Amazon. The Horned Caiman is also a great prize. Like the Broad-headed Crocodile it is for the first time exhibited in our Reptile House.

The writer feels particularly proud of the collection of batrachians obtained abroad. The result of the addition of representative series of toads, frogs, salamanders and newts, are several grouped exhibits on the main floor of the Reptile House—features we have long needed, as the batrachians, with their varied strange forms and brilliant colors are always of great interest to the public. An enormous Japanese Giant Salamander was bought of Carl Hagenbeck and now occupies a commodious tank. A case containing a number of species of Tree Toads has been arranged and attracts much attention. This contains the gorgeously-hued Golden Tree Toad, *Hyla aurea*, of Australia and five other species. A series of fourteen cages now forms an exhibit showing the frogs and toads of Europe. The most attractive among the new batrachians, however, are a dozen specimens of the strange Aquatic Toads, from Africa, these representing two species:—*Xenopus laevis* and *X. muelleri*. These eccentric creatures are strictly aquatic—never leaving the water. The hind feet are extremely broad and the graceful swimming movements of these animals at once

suggest the actions of broad-finned fishes. The eyes are small and placed directly on the top of the head.

We have placed these toads in a conspicuous tank and they form a novel exhibit. Explanatory labels tell of their relationship to the Surinam Toad, *Pipa americana*, of South America, which they resemble in structure and habits. They differ from the *Pipa* in the breeding habits, however, the eggs being attached singly to water plants or stones. The tadpole is provided with a pair of long tentacles, causing the larva to resemble an elongated catfish.

With the close of his report the writer wishes to express his hearty appreciation for the hospitality extended in London, by Dr. P. Chalmers Mitchell, Secretary of the Zoological Society of London, and Superintendent R. I. Pocock, of the London Zoological Gardens. Without the valuable assistance given him, in providing a headquarters with the presence of skilled keepers, it would have been practically impossible to care for his rapidly accumulating collection and to place the animals on board ship in good condition and well caged. The food required for this miscellaneous collection involved about everything used in feeding animals. Head-keeper Hockingdon, of the London Gardens, supervised his carpenters in making up a series of substantial travelling cages to take the places of those sent from the dealers—which latter cages were lacking in conveniences for feeding and cleaning. Scrapers and other travelling paraphernalia were also made at the Zoological Gardens in London—in fact, everything done to facilitate a successful shipment across the Atlantic—and with the results already described.



PURPLE DEATH ADDER.

NEW FEATURES IN THE EUROPEAN ZOOLOGICAL GARDENS.

By RAYMOND L. DITMARS.

HAVING recently returned from an inspection of the zoological institutions of Great Britain and the Continent, the writer begs leave to present a general résumé of his observations on the newer features of interest. The tour in question embraced the zoological gardens, private collections and museums, as follows:—(England)—Gardens of the Zoological Society in London; the collection of hoofed animals of the Duke of Bedford, at Woburn; the Natural History Museum and Aquarium in Liverpool. (Holland)—the Zoological Gardens in Amsterdam; the Zoological Gardens in Rotterdam. (Belgium)—the Zoological Gardens, Antwerp. (France)—the collection of animals in the Jardin des Plantes, and the Museum within the same boundaries. (Germany)—Zoological Gardens, at Cologne, Frankfort, Dresden, Berlin, Hannover, Halle, Hamburg; Hagenbeck's Tierpark, at Stellingen (Hamburg).

Among the new features in the Zoological Gardens of London are the Prosectorium and Quarantine House. The former was well on its way to completion when the writer left London, in July. It forms a new floor over the Reptile House and is constructed along the lines of a research laboratory, with three large, separate working rooms, each brilliantly lighted with large windows facing the north. Immediately in the rear of the Reptile House is the new

Quarantine Building, a brick structure with all conveniences for the isolation and examination of newly arrived animals.

Among the newly arrived animals in the London Gardens was the Takin, *Budorcas taxicolor*, exhibited for the first time alive in any zoological collection. Another rare animal was an Aard Vark, which was yet under observation in the Quarantine Building. In the Small Bird House was a magnificent series of Birds of Paradise of over half a dozen species—the series filling the big wall cages on each side of the building. All of these birds were in splendid condition, and the writer was informed that once in captivity they are as hardy as crows. It is their capture in New Guinea, and the risk of extended transportation from the home country, that cause their rarity in captivity. The collection of primates in the London Gardens was in superb condition—the coats of the animals fairly glowing with health. Superintendent Pocock informed the writer that the temperature of the Monkey House is kept quite low during the winter,—often registering as low as 40° Fahrenheit. All of the monkeys are provided with sleeping-boxes, packed with hay. The Rhesus Monkey, Mandrill, Hamadryas, Thoth and Chacma Baboons, remain out of doors throughout the winter. They are provided with sleeping-boxes and hay bedding, but the sleeping-boxes are not furnished with artificial heat. All of these specimens were in superb condition.

Zoological Gardens in Amsterdam.—The Monkey House in Amsterdam is ideal. This structure appears to the writer to offer the most perfect sanitary conditions of any animal building in Europe. It has many novel features, among them being elaborate skylights made up of *vacuum tiles*. This offers the great advantage of ideal illumination, with its germicidal effects, yet without the heat in summer, or cold during the winter months, that comes with a building with a great area of illuminating surface. The writer noted the use of these vacuum glass tiles in Rotterdam, also, and it was explained to him that they prevent the passage of heat or cold as they are cast hollow, and then subjected to an air extracting process. With its white tiled floor, its central fountain, cages with glazed tiles and brilliant, though diffused illumination, the effect of this building is that of beauty, wonderful cleanliness, and perfect sanitation,—particularly on account of the absence of woodwork.

Amsterdam has the most interesting and ingeniously arranged collection of insects of any such installation noted by the writer. There is an elaborate series of cases containing feeding caterpillars and others hung with masses of developing cocoons, from which numerous showy moths were hatching. On the walls were cases with fine mounted displays of the life histories of the lepidopterous insects of Holland. The most striking feature among the series of entomological exhibits was a display of ants. These were enclosed in narrow square glass cases, about three feet long and high. The nest was made of cement, and had been burrowed and channeled with great care to imitate the tortuous chambers naturally made by the insects. The exhibit was then mounted in the shallow case to appear as a transverse section of a big ant mound. On the front of the case is a black cloth curtain, to keep the exhibit dark,—this may be raised at the will of the visitor. When the curtain is raised the channels are seen alive with ants performing their various duties. The workers are seen caring for the larvæ, and in one case, quite spectacularly quartered in the center, was a large queen ant, attended by her busy consort. Also exhibited in the Insect House was a curious collection of walking "sticks" and several jars of ant "lions," which little insects lie at the bottom of a funnel-shaped burrow of fine sand, the jaws only protruding. Unwary ants that pass near the edge of this burrow are brought down by a miniature shower of sand hurled up by the "lion." The jars of aquatic insects demonstrated the interesting possibilities in an exhibit of this kind. About every zoological garden on the continent has its insect house—several of these are of recent installation. An installation of this kind would be of great interest in New York.

Among the rare reptiles in Amsterdam, the choicest specimen was an example of the Bornean Gavial, *Tomistoma schlegeli*. The head and snout of this remarkable creature might be compared to a banjo with a long handle. The beautiful Aquarium was very fully stocked. The Electric Eel and Electric Cat-Fish were exhibited in adjoining tanks. In the batrachian room was a tank containing a number of examples of the Blind Salamander from the Adelsberg Cave, in Austria.

Rotterdam Zoological Gardens.—Through the courtesy of the Director, Dr. J. Büttikofer, the writer was enabled to witness and appreciate at the Rotterdam Zoological Gardens, one of the

most interesting zoological spectacles in Europe. This consists of the heronry, tenanted by wild birds, and situated immediately outside of the big flying cage. A large collection of wading birds was on exhibition in the flying cage, and a number of these were nesting. Inside the cage was a stork on her nest, and the young could be observed lifting their heads for food. This presence and nesting of the captive birds had attracted the wild Blue Heron, many pairs of which had built the great rookery in the tall trees immediately outside the flying cage. From this rookery comes a continual guttural croaking, and there is a constant procession of the old birds coming and going, their long legs trailing behind them in picturesque fashion. From the masses of nests may be seen the wobbly heads of the young, clamoring for food, or crowding out on dangerously swaying branches were well feathered youngsters unsteadily clutching their lofty perches in an eager watch for the parents' return. Dr. Büttikofer informed the writer there were eighty-two nests in this wonderful rookery. Seventeen big nests, coarsely constructed of sticks and brush, were counted in a single tree. The old birds have a half-hour's flight to get to their fishing grounds.

The Monkey House in Rotterdam resembles the Amsterdam structure in the liberal use of glazed tile. The monkeys run into outside cages for the greater part of the year, passing through doors which swing either way, and which the animals operate with as much nonchalance as climbing their perches.

The new Reptile House in Rotterdam is a fine and practical little building. Here the writer again noted the use of the glass vacuum tiles,—practically the entire roof being of this construction,—which causes the building to be flooded with diffused sunshine. The cage decorations were beautifully arranged,—a combined use of tuffstone, moss, earth and plants imparting a very natural effect. The earth was neither too dry nor too wet—hence the reptiles appeared to be in exceptionally good condition. The brilliant illumination of the building appears to effect this condition. There was an excellent series of reptiles. The Rotterdam and Frankfort Gardens are way in the lead as regards reptile collections on the Continent. Among the more interesting reptiles noted in the Rotterdam Reptile House were the Gaboon Viper, African Cobra, American Diamond Rattlesnake, Regal Python, Black-Tailed Python.

Australian Diamond Python and Carpet Python, a full series of Crocodilians, lizards of many species and a series of tortoises—among the latter being two specimens of *Testudo elephantina*, from the Aldabra Islands.

Antwerp.—Although there appears to be no recent installation in the Antwerp Gardens, new specimens are constantly added. A long, high cage, with artistically painted background, offered a spectacular display owing to its contents, which consisted of over two dozen Flamingoes and seventy-five Purple Gallinules. The smaller, iridescent birds, running in every direction among the tall pink forms of the flamingoes offered a striking display.

Cologne.—Of particular interest in the Zoological Gardens is the breeding of two Giraffes, both of which are in perfect condition. One example was born on May 26th, 1907, and the latest arrival, on April 4th, 1909. This youngster was alert and active when the writer inspected him the following June after his birth. He was about 6 ft. in height, with wisps of black hair standing on that portion of his head from which the horns will grow.

Frankfort.—The collection of reptiles in the Frankfort Gardens is particularly noteworthy. The reptiles are housed in the top of a grotto-like structure. The walls of the reptile enclosure are of the vacuum tiles previously mentioned, which, together with a glass roof floods the place with light. Among the lizards were a number of fine chameleons, the Australian *Tiligua*, Spike-Tailed Lizard, *Zonurus*, Tegus, and a full series of the lizards of Europe.

The collection of batrachians was very complete, embracing the Blind Salamander of the Adelsberg Cave, Giant Salamander, Hellbender, South American Toads of several species and many Tree Toads. The collection of snakes was the finest on the Continent. Especially interesting among these were the Gaboon Viper, Puff Adder, Russell's Viper, Horned Viper, Desert Viper, Sandnatter, Cape Viper, Australian Blacksnake and Indian Cobra. There is a good representative series of North American serpents.

Berlin.—The magnificent Gardens in Berlin offered nothing particularly new, but it is interesting to note the successful breeding of the Giraffe here, in April of this year. While noting this subject it should be mentioned that a Giraffe was also bred in the London Gardens last year, and is in thriving condition.

Berlin is fortunate in having on exhibition a number of specimens of the wild Guinea "Pig," *Cavia porcellus*, of South America. These animals look like fat, tailless gray rats and are extremely timid. Owing to the rigid quarantine existing against South American rodents, it is now impossible to import this interesting animal.

Zoological Gardens at Halle.—At Halle on the Saale, delightfully situated, ingeniously laid out, and with many novel features, is a zoological institution that promises to be among the most interesting in Europe. The gardens of Halle offer a series of surprises: for the winding walks that lead up the hill to the mountain goats, thence down to other installations, bring one unexpectedly upon changing scenes, exhibits and all sorts of pleasing nooks and vistas of the surrounding landscape. These gardens are young and the buildings not elaborate in number as yet, but everything is ingeniously quartered and there is a valuable collection. There is a marked fraternal spirit in the exhibit of some of the animals. The Indian Blackbucks and Ostriches were running in the same enclosure. The Camels and Yaks roamed together, and in a medium-sized cage was a rollicking family of Raccoons and Coatis. Few zoological gardens can boast of a more picturesque site and such possibilities of interesting development as the Gardens at Halle.

Hamburg.—A new feature of Hagenbeck's Tierpark, at Stellingen, is the Ostrich Farm, situated immediately across from the main entrance of the Tierpark, and being distinct in requiring a separate admission of 50 pf. It is well worth the visitor's time to inspect this novel venture. Mr. Hagenbeck informed the writer that he expects his birds to grow much finer plumes in the cold climate of Hamburg than those ostriches on farms in the hot countries. There are ten breeding houses, each with two long yards and separate compartments. Each of these houses is intended to accommodate a pair of birds. A great central yard and commodious shelter building accommodates the main herd. A very complete incubator, with capacity for a great number of eggs, is part of the exhibit. The ostrich farm was opened in July, with one hundred and ten ostriches—all of the species being represented.

Prior to the opening of the Ostrich Farm, the main herd of birds was running in a fifteen-acre pasture. The multitude of long necks, above which towered the heads of some really gigantic males, formed an imposing picture.

ZOOLOGICAL SOCIETY BULLETIN.

Elwin R. Sanborn, Editor.

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EDITED BY C. WILLIAM BEEBE,
Curator of Birds.



FULL LENGTH VIEW OF THE DUCK AND SWAN ENCLOSURE.

BREEDING CANADA WILD GEESE ON CHINCOTEAGUE ISLAND, VA.

By C. WILLIAM BEEBE.

INDUSTRIES connected with semi-wild birds are becoming more and more important every day. We have large Pheasant hatcheries which have been installed in many states during the last few years, while the providing of suitable nesting sites for Eider Ducks has been in practice for many years in different places. As far as I know the only successful example of raising Canada Wild Geese for their feathers, is to be found on the estate of Mr. J. W. Whealton on a good-sized island off the coast of Virginia, close to the Maryland line.

Chincoteague Island is about seven by two and a half miles in size, with a soil which is sandy but fertile. Low ridges run parallel to the coast, separated from each other by marshes, while a central depression filled with salt water extends transversely across the center of the island. There is considerable scrub pine and cedar growth with some underbrush, the trees and bushes being found mostly upon the ridges. Much of the island, however, is open and marshy. Mink are very abundant and destructive, and while Foxes are also common they seem to do little harm.

More than fifty years ago Mr. Whealton obtained a pair of wing-tipped wild geese. These, however, showing no signs of breeding, he disposed of, and purchased a second pair which had been raised in captivity. These were the nucleus of his present flock which now numbers about 450 birds. There has been no in-breeding as new blood has been constantly added by the capture of wing-tipped wild ganders every year or two. At times wild birds have come in from the bay with the tame ones, and fed with them for several days. Great effort is made to get the big leaders of the flocks. Wild ganders breed at once, but it is years before the wild geese will consent to lay. Mr. Whealton's geese are divided into flocks of from four to fifty birds, running wild on this and several adjacent islands. All are pinioned when small goslings.

There is considerable population on Chincoteague, but the geese do no damage and the fact that they are all the property of Mr. Whealton is known to everyone. The geese rarely die from disease, although a few succumb to pneumonia. Negroes steal a small number, but the greatest loss is from dogs which kill quantities of the geese every year. In 1908 no fewer than twenty-six dogs were killed in the very act of slaughtering the geese.



CANADA GEESE AND TOULOUSE HYBRIDS.

The geese feed on the island in summer in small gangs; but in winter they spend most of their time in Chincoteague Bay, feeding on eel grass and sea lettuce. They become very fat on this diet and in addition are fed a little grain now and then to keep them tame. They are also supplied with fresh water throughout the winter. In the spring, on one of the first warm days in March, the Canada Geese pair off, gathering near the large breeding pastures, when they are let in, one pair at a time. There is a great deal of quarrelling among them and a few pairs are always broken up.

The geese are grain fed for a short time before laying, all through incubation and until they are set at liberty with their young. The birds are never infested with lice, and it is thought that their feathers contain some quality which keeps these pests out.

The breeding paddock encloses about 25 or 30 acres and is surrounded by a board fence about 3 feet in height. About 75 pairs of birds breed here and raise from two to three hundred young annually. There are a few small fresh water marshes in the paddock, and where these occur num-

erous hummocks are thrown up, which soon become covered with grass and low brush. These tiny islands are the favorite nesting sites and five to seven eggs are laid on these nesting hummocks. When the young hatch, they are pinioned and turned into another pasture with their parents. If the goose is removed, the gander will rear the young successfully. But if the gander is killed by accident or sent away, the female will not or cannot rear her brood alone.

Some of the birds are almost fifty years old. They breed better when thirty than when ten years of age. A few individuals never mate. In the spring, one

familiar with the appearance of the birds can select those which will lay, by the condition of fatty deposits visible under the skin. If considerable yellow fat is visible about the abdomen, there is no likelihood of the bird laying eggs that season.

When the goslings reach the age of about one month, they are given their liberty. They usually do not breed until three years old. Each pair of adult birds mate for life and invariably returns to the nest which it had occupied the previous spring. The geese will not as a rule



DUCK AND SWAN ENCLOSURE; COMPARTMENT No. 1.
Containing Black Australian Swans and Cygnets, Shoveller Ducks, Wood Duck
and Black Brant.



SNOW GEESE HYBRIDS, CHINCOTEAGUE ISLAND.

allow other pairs to nest within fifty to one hundred yards. The ganders are very erratic in this respect, some being especially savage, while others do not object to new comers founding their nests a shorter distance away. The birds are strictly monogamous. In the fall, all deformed or undersized birds are disposed of, and only the largest and finest are kept. Many young birds are sold for ornamental purposes and for decoys.

According to Mr. Whealton and the men who have charge of the birds, there seem to be two so-called races, known as the Northern and the Southern Wild Geese. The latter are smaller and darker and differ greatly in their habits. They are very wild, never becoming tame; are sly and tricky, of a cowardly disposition, and do not interbreed with the other race. They have been eliminated from the flock because of their undesirable traits, but a few are kept by other people, as they breed fairly well.

The geese are plucked three or four times each year, beginning with May first, and from then on at intervals of seven weeks; all of the contour feathers with the exception of those of the wings, tail and neck are taken, the down of course being left. An average adult bird yields about one-third of a pound at a picking, and the market value of these feathers is about 50c. a pound. The first picking (May 1st) occurs when the birds are tending their young. It stops to a certain extent the fighting which is always going on at this time; both by reducing the strength of the birds and by making it less

easy for them to obtain a good hold, or to strike each other with their wings. The first and last pluckings yield the heaviest feathers; the mid-summer plumage being lighter. At these times a large party of men and boys corral the geese from various parts of the island into a large pen. As the geese are picked they are liberated.

That Chincoteague Island is adapted not only for the rearing of wild geese alone, is shown by the success which Mr. Whealton has had with other species of water birds. The swans, — Mute, Whooping and Black, are simply turned

out in pairs, separated from others. They are kept there continually, and when once they have started to breed, they continue to do so every year. All of the paddocks have plenty of forage, but the birds are fed daily on wheat and corn. During the present year the Black Swans made their nest and laid their eggs when the snow was on the ground, hatching their young in February, when the pond was frozen tight. A hole was cut in the ice and the young, four in number, were successfully raised.

Hybrids have been produced between Canada Geese ("Northern" Race), and Toulouse, Embden and Chinese Geese. These hybrids lay eggs but they are never fertile.

Crosses between the Common and Snow Geese are fertile and have been bred back to pure Snows for several generations, the hybrids being indistinguishable from pure-blooded Snow Geese. Toulouse hybrids are very large birds with the body color of a Toulouse, but with the head and neck very nearly white. They are invariably sterile.

The Chinese hybrids, when young, are a shade darker than the Canada Geese. When they reach adult plumage, they become lighter in color, and only one who is accustomed to them can distinguish them from pure-blooded Canada Geese.

The Snow Geese hybrids were originally produced with a white Common Goose and a Snow gander. The offspring are usually white with dark wings and sometimes dark tails also. They retain the mandibular hollow of the Snow Geese. When this hybrid is bred back with the pure Snow, a white goose is produced that can be

told from the pure Snow Goose, only by the very slightly smaller size.

The only successful method of hybridizing is by confining a selected pair of geese together in a paddock. In the majority of cases the birds refuse to mate.

Black Ducks are kept in a paddock of about four acres containing a fresh water pond well supplied with lettuce and eel grass of which the birds are very fond. Tall grass, weeds and bushes are thick, and the birds breed usually among this low vegetation. During the present year seventy-five young Black Ducks were hatched, but every one was killed by a murderous Egyptian gander. Black Ducks are wild in disposition, and will mate only in large paddocks.

The Snow Goose lays its eggs on the ground near the water, in an enclosed paddock, the eggs usually not being fertile. In 1900, however, four young Snow Geese were half raised but were killed by dogs. The Common Brant Geese mate but never lay.

THE PONIES OF CHINCOTEAGUE.*

By LEE S. CRANDALL.

CHINCOTEAGUE and Assateague Islands in Virginia each support a drove of ponies, numbering from fifty to one hundred individuals. They forage for themselves winter and summer, receiving no more care than the wild mustangs of the West.

Tradition has it that these semi-wild ponies are the descendents of Spanish horses, which came ashore from a foundered galleon. This seems a reasonable explanation, and is generally accepted.

In general appearance the ponies closely resemble mustangs, to which they are undoubtedly related. Rarely exceeding fourteen hands in height, they are thick and stocky, with the smallest of ears and hooves. The manes and tails are extremely long in typical specimens, and many of the little animals are very handsome. In winter, of course, their coats are

rough and shaggy, but in summer they are as smooth and sleek as satin. All of the self colors known among the mustangs are found among the eastern animals, buckskins and even creams being common. Calicoes, pintos, and other pied forms are, however, never found among them, stockings and blazes being the extreme of white markings.

In temperament, on the other hand, they are the perfect antitheses of their western cousins. Gentle and kind, they make splendid saddle ponies, and the savage bucking of the mustangs is absolutely unknown among them. Many are broken for driving, and are safe and reliable, thus differing radically from the western ponies, which are notoriously unruly in harness.

They are prolific breeders (continued inbreeding has apparently not decreased their vigor), and each mare has a colt at her side. Each fall a roundup is held, when all of the colts are caught and branded.

When surrounded, and no avenue of escape presents itself, the ponies at once commence to "mill" after the fashion of mustangs and cattle, working around the circumference of a circle, with the colts inside.

The herds are, in each case, led by a splendid stallion, who has complete command. At various times, as the young stallions increase in age and weight, they challenge the leader to battle for his position. Many vicious combats result, which are often of long duration. Rearing on their hind legs, wrestling for an opening like skilful boxers, biting, striking and squealing, they will at times whirl from the top of a ridge into the surf, and out into the sea, often to the level of their backs. The old leaders are rarely overcome until weakened by age, because they have gained strength and experience from years of warfare, and the younger animals are usually no match for them.

These little animals range free over the two islands, feeding on the succulent young grass in summer, and getting a scantier livelihood from the dried blades through the winter months. When the mosquitoes and horse flies become unbearable, the herds stand leg deep in the surf.

The native owners guard their animals with jealous pride, never introducing new blood for fear of "spoiling the breed." The ponies are in great demand both on the island and the mainland, and a very profitable traffic has been built up.

*Mr. Crandall recently made a trip to Chincoteague Island, Virginia, in the interests of the Zoological Society, and while there gathered the following information concerning the semi-wild horses found in that region. The facts are of decided interest and well warrant publication.

WILD BIRDS BRED IN CAPTIVITY IN THE EASTERN UNITED STATES.

GALLIFORMES

| | | |
|-----------------------------------|--|-------------------|
| Globose Curassow..... | <i>Crax globicera</i> | Gould. |
| Ruffed Grouse..... | <i>Bonasa umbellus</i> | Hodge. |
| Cabot Tragopan..... | <i>Tragopan caboti</i> | Kuser. |
| Impeyan Pheasant..... | <i>Lophophorus impeyanus</i> | Little. |
| Manchurian Eared Pheasant..... | <i>Crossoptilum manchuricum</i> | Little. |
| Black-crested Nepal Pheasant..... | <i>Gennadens leucomelanus</i> | N. Y. Zool. Park. |
| Melanotus Pheasant..... | “ <i>melanotus</i> | Kuser. |
| Anderson Pheasant..... | “ <i>andersoni</i> | N. Y. Zool. Park. |
| Lineated Pheasant..... | “ <i>lineatus</i> | Little. |
| Silver Pheasant..... | “ <i>nythemerus</i> | N. Y. Zool. Park. |
| Swinhoe Pheasant..... | “ <i>swinhoi</i> | Kuser. |
| English Pheasant..... | <i>Phasianus colchicus</i> | N. Y. Zool. Park. |
| White Pheasant..... | “ <i>var.</i> | N. Y. Zool. Park. |
| Ring-necked Pheasant..... | “ <i>torquatus</i> | N. Y. Zool. Park. |
| Versicolor Pheasant..... | “ <i>versicolor</i> | Kuser. |
| Reeves Pheasant..... | <i>Syrnaticus reevesi</i> | N. Y. Zool. Park. |
| Golden Pheasant..... | <i>Chrysolophus pictus</i> | N. Y. Zool. Park. |
| Lady Amherst Pheasant..... | “ <i>amherstiae</i> | N. Y. Zool. Park. |
| Red Jungle Fowl..... | <i>Gallus gallus</i> | N. Y. Zool. Park. |
| Indian Peafowl..... | <i>Pavo cristatus</i> | N. Y. Zool. Park. |
| Black-winged Peafowl..... | “ <i>nigripennis</i> | N. Y. Zool. Park. |
| Wild Guinea Fowl..... | <i>Numida meleagris</i> | N. Y. Zool. Park. |
| Wild Turkey..... | <i>Melagris gallopavo silvestris</i> | N. Y. Zool. Park. |
| Plumed Quail..... | <i>Oreortyx pictus plumiferus</i> | N. Y. Zool. Park. |
| California Quail..... | <i>Lophortyx californicus</i> | N. Y. Zool. Park. |
| Bob-white..... | <i>Colinus virginianus</i> | Hodge. |

COLUMBIFORMES

| | | |
|--------------------------------|--|-------------------|
| White-backed Pigeon..... | <i>Columba leuconota</i> | Whitman. |
| Rock Dove..... | “ <i>livia</i> | N. Y. Zool. Park. |
| Stock Dove..... | “ <i>oenas</i> | Whitman. |
| Triangular-spotted Pigeon..... | “ <i>guinea</i> | Whitman. |
| Bare-eyed Pigeon..... | “ <i>gymnophthalma</i> | Whitman. |
| Spotted Pigeon..... | “ <i>maculosa</i> | Whitman. |
| White-crowned Pigeon..... | “ <i>leucocephala</i> | Whitman. |
| Rufous Pigeon..... | “ <i>rufina</i> | Whitman. |
| Band-tailed Pigeon..... | “ <i>fasciata</i> | Whitman. |
| Wood Pigeon..... | “ <i>palumbus</i> | Whitman. |
| Passenger Pigeon..... | <i>Ectopistes migratorius</i> | Whitman. |
| Mourning Dove..... | <i>Zenaidura macroura carolinensis</i> | Worthington. |
| Venezuela Dove..... | <i>Zenaida vinaceo-rufa</i> | Whitman. |
| White-winged Dove..... | <i>Melopelia leucoptera</i> | Kuser. |
| European Turtle Dove..... | <i>Turtur turtur</i> | N. Y. Zool. Park. |
| Oriental Turtle Dove..... | “ <i>orientalis</i> | Whitman. |
| Barbary Turtle Dove..... | <i>Streptopelia risoria</i> | N. Y. Zool. Park. |
| White Turtle Dove..... | “ <i>var.</i> | Whitman. |
| Damara Turtle Dove..... | “ <i>damarensis</i> | Whitman. |
| Indian Turtle Dove..... | “ <i>douraca</i> | Whitman. |
| Dwarf Turtle Dove..... | <i>Onopopelia humilis</i> | Whitman. |
| Chinese Turtle Dove..... | <i>Spilopelia chinensis</i> | Whitman. |
| Tigrine Turtle Dove..... | “ <i>tigrina</i> | Whitman. |
| Senegal Turtle Dove..... | <i>Stigmatopelia senegalensis</i> | N. Y. Zool. Park. |
| Barred-shouldered Dove..... | <i>Geopelia humeralis</i> | Thompson. |
| Peaceful Dove..... | “ <i>tranquilla</i> | Whitman. |
| Barred Dove..... | “ <i>striata</i> | Whitman. |
| Graceful Ground Dove..... | “ <i>cuneata</i> | Thompson. |
| Inca Dove..... | <i>Scardafella inca</i> | Whitman. |
| Northern Ground Dove..... | <i>Chamaepelia passerina</i> | Whitman. |
| Talpacoti Ground Dove..... | “ <i>talpacoti</i> | Whitman. |
| Bronze-winged Pigeon..... | <i>Phaps chalcoptera</i> | Whitman. |
| Australian Crested Pigeon..... | <i>Ocyphaps lophotes</i> | Kuser. |
| White-fronted Dove..... | <i>Leptoptila fulviventris brachyptera</i> | Whitman. |
| Reichenbach Dove..... | “ <i>reichenbachii</i> | Whitman. |
| Wonga-wonga Pigeon..... | <i>Leucosarcia picata</i> | Whitman. |

LARIFORMES

| | | |
|----------------------------|-------------------------------|-------------------|
| European Herring Gull..... | <i>Larus argentatus</i> | N. Y. Zool. Park. |
|----------------------------|-------------------------------|-------------------|

GRUIFORMES

Demoiselle Crane..... *Anthropoides virgo*..... Kuser.

ARDEIFORMES

White Ibis..... *Guara alba*..... N. Y. Zool. Park.
Black-crowned Night Heron..... *Nycticorax nycticorax naevius*..... Nat'l Zool. Park.

ANSERIFORMES

Whooping Swan..... *Cygnus cygnus*..... Whealton.
Mute Swan..... " *olor*..... Nat'l Zool. Park.
Black Swan..... *Chenopsis atrata*..... Whealton.
Wood Duck..... *Aix sponsa*..... N. Y. Zool. Park.
Mandarin Duck..... " *galericulata*..... Cox.
Greater Snow Goose..... *Chen hyperborea nivalis*..... Whealton.
Bean Goose..... *Anser fabilis*..... Gallatin.
Canada Goose..... *Branta canadensis*..... N. Y. Zool. Park.
Ruddy Sheldrake..... *Casarca casarca*..... Browning.
Mallard Duck..... *Anas platyrhynchos*..... N. Y. Zool. Park.
Black Duck..... " *obscura*..... Gallatin.
Australian Gray Duck..... " *superciliosa*..... Kuser.
Gadwall..... *Chaulelasmus strepera*..... Hudson.
European Widgeon..... *Mareca penelope*..... Cox.
Green-wing Teal..... *Nettion carolinensis*..... Cox.
Blue-wing Teal..... *Querquedula discors*..... Cox.
Pintail Duck..... *Dafila acuta*..... Cox.
Chilian Pintail Duck..... " *spinicauda*..... Kuser.
Shoveller Duck..... *Spatula clypeata*..... Cox.
Red-head Duck..... *Iythya americana*..... Gallatin.
Canvas-back Duck..... " *rallisneria*..... Lawrence.
Indian Spotted-bill Duck..... *Polionetta poecilorhyncha*..... Gallatin.

PELECANIFORMES

Florida Cormorant..... *Phalacrocorax dilophus*..... Nat'l Zool. Park.

ACCIPITRIFORMES

Bald Eagle..... *Haliaeetus leucocephalus*..... Buff. Zool. Gdn.

PSITTACIFORMES

Cockateel..... *Calopsittacus norae-hollandiae*..... Browning.
Carolina Parakeet..... *Conuropsis carolinensis*..... Phila. Zool. Gdn.
Grass Parakeet..... *Melopsittacus undulatus*..... N. Y. Zool. Park.
Black-faced Lovebird..... *Agapornis personata*..... Thompson.

PASSERIFORMES

MIMIDAE

Curacao Mockingbird..... *Mimus gilvus rostratus*..... N. Y. Zool. Park.
Catbird..... *Galeoscoptes carolinensis*..... Kuser.

TURDIDAE

Gray Robin..... *Planesticus tristis*..... N. Y. Zool. Park.
American Robin..... " *migratorius*..... N. Y. Zool. Park.
Wood Thrush..... *Hylocichla mustelina*..... N. Y. Zool. Park.
Rock Thrush..... *Monticola saxatilis*..... Worthington.
Bluebird..... *Sialia sialis*..... N. Y. Zool. Park.

SITTIDAE

White-breasted Nuthatch..... *Sitta carolinensis*..... Worthington.

FRINGILLIDAE

Rose-breasted Grosbeak..... *Zamelodia ludoviciana*..... N. Y. Zool. Park.
Saffron Finch..... *Sycalis flaveola*..... Thompson.
Song Sparrow..... *Melospiza melodia melodia*..... Worthington.

PIOCEIDAE

Cut-throat Finch..... *Amadina fasciata*..... Thompson.
Zebra Finch..... *Taeniopygia castanotis*..... Browning.
Black-headed Mannikin..... *Munia atricapilla*..... Worthington.
Gray Java Sparrow..... " *oryzirora*..... N. Y. Zool. Park.



BALD EAGLES 65 DAYS OLD, TWO HOURS AFTER LEAVING NEST.
Hatched April 18, 1909, at the Zoological Garden, Buffalo, N. Y.

The list of authorities are the ones which, as far as I can ascertain, were the first to breed the species mentioned. The full names and localities are as follows:

Browning, Wm. H.—Rye, New York.

Buffalo Zoological Garden—Dr. F. A. Crandall, Jr.

Cox, John A.—Fieldstone Farm, East Brewster, Mass.

Gallatin, Frederic—Noroton, Conn.

Gould, Aviary of Howard—Mallory in charge—Port Washington, L. I.

Hodge, C. F.—Worcester, Mass.

Hudson, Percy K.—East Norwich, Long Island.

Kuser, Col. Anthony R.—Bernardsville, N. J.

Lawrence, W. B.—Flushing, Long Island.

Little, Dr. Geo. W.—Glens Falls, N. Y.

National Zoological Park—Frank Baker, Director—Washington, D. C.

New York Zoological Park—W. T. Hornaday, Director.

Philadelphia Zoological Park—A. I. Brown, Director.

Thompson, Aviaries of Mrs. F. F.—E. A. Watts in charge—Canandaigua, N. Y.

Whealton, J. W.—Chincoteague, Virginia.

Whitman, C. O.—Chicago, Ills.

Worthington, Aviaries of C. C.—C. W. Miller in charge.

It is hoped that anyone who has bred species of birds not on this list will send their records with full data to the Editor of this department.

I have recently compiled the above tentative list of the species of wild birds which have been bred in captivity in the Eastern United States. It numbers 109 species, and this will doubtless be doubled or trebled when many persons who have not as yet replied to my inquiries, have sent in their reports. The list, meagre as it is, includes some interesting species and several are worthy of more detailed mention.

European Herring Gulls.—The European Herring Gulls formed a successful breeding colony in the New York Zoological Park several years ago until they were exterminated by wild minks which came down the Bronx River, thus carrying their depredations into the very heart of New York City. The mink danger has now been overcome and a new lot of young gulls has been obtained from Lake Champlain, through the kindness of Mr. Edward Hatch, for the purpose of re-establishing the colony.

Bald Eagle.—The breeding of the BALD EAGLE in captivity in the Buffalo Zoological Gardens is, I believe, the first and only record. Dr. F. A. Crandall, Jr., has kindly furnished the following data and photograph of the young eagles:

"The mother bird was caught in Georgian Bay, Canada, in 1898. The father was brought from Alaska in 1903. Both birds were between two and three years old when received."

"The female has had three mates, the first for two seasons, and one each for the last two years. She has laid four clutches of eggs, the first two

of which were not fertile. The eggs laid when paired with the second male proved good, and they were within one day of hatching when accidentally destroyed by freezing."

"The last mate she chose was the Alaskan bird above described. Two eggs were laid, and on the third day incubation began. They hatched just thirty-one days later on April 18th, 1909. The young eagles left the nest when sixty-five days old and were then in general appearance larger than the father."

Carolina Parakeets.—The Carolina Parakeet was bred in the Philadelphia Zoological Garden on September 9th, 1885, when one bird was hatched from an egg which had been placed under a Turtle Dove. The period of incubation was fourteen days.

Curacao Mockingbirds.—The Curacao Mockingbirds rear one or two broods year after year in a cage only four by five, by eight feet high in the New York Zoological Park. Thousands of people pass daily within six feet of the nest without disturbing the sitting bird, or causing the male to interrupt his singing, which he continues long after his mate has begun incubation.

Avicultural Magazine.—The best advice to anyone who is contemplating keeping an aviary of living birds is to subscribe to THE AVICULTURAL MAGAZINE. This very interesting monthly is published in England at \$2.50 a year, and the officer who receives subscriptions is Mr. T. H. Newman, Harrowdene Road, Wembly, Middlesex.

In the far west of our own country, bird lovers may join the Avicultural Society of California, the official organ of which is BIRD NEWS, a modest but promising bi-monthly with a subscription price of 75c. a year.

Interest in living birds is rapidly increasing in our country and, as has been well proven in England, there is no better way of arousing a wholesome, humane love of wild birds among the people than by encouraging the keeping of live birds. With roomy cages and suitable food they become tame, sing, play, nest freely and are as happy when well cared for as their brethren in the woods and fields.

EXPERIMENTAL ACCLIMATIZATION.

I.—American Robins in England.

AN experiment which has apparently proved successful is the introduction of the American Robin (*Planesticus migratorius*) into England. Late in December of last year Lord Northcliffe took back eighteen American Robins which we secured for him, and all but one of their number reached their English home in

safety. Late in March these birds began to build nests and lay eggs, but all were confined in the same enclosure, and the constant rivalry and fighting resulted in many casualties. So the eggs were removed as soon as laid and placed in the nests of Thrushes and European Blackbirds who did well as foster parents, and successfully reared twenty-four young "Yankee" Robins.

About the middle of June all the robins, old and young, were liberated on Lord Northcliffe's estate and at last report they were doing well; a number of nests had been made and young birds reared in the open, and but little propensity to stray was evinced.

The crucial point of the experiment will come at the time of migration. Considering how many of our Robins winter with us in sheltered places it is not impossible that those in England may be contented to remain more or less sedentary throughout the winter, especially as the English winter is so much milder than ours. If the birds should migrate and any can be located in their winter quarters, valuable data may result, in showing whether present geographical conditions, or the mere accompanying of other migrant birds, will influence their choice of direction. Such an experiment in the southern hemisphere would be even more valuable in this respect.

II.—Birds of Paradise in Trinidad.

Sir William Ingram sent an expedition last spring to the Aru Islands near New Guinea in search of live birds. Among other interesting species, fifty Greater Birds of Paradise (*Paradisæa apoda*) were obtained which are now being prepared for shipment to our hemisphere. They will be liberated on the estates of Sir William Ingram in the Island of Trinidad, off the northeast coast of South America. The outcome of this attempt at the acclimatization of such rarely beautiful birds in a region so remote from their native haunts will be of the greatest interest.

III.—Mockingbirds and Cardinals Near New York.

An extensive attempt will soon be made by the writer to introduce Mockingbirds and Cardinals—or rather to reintroduce them—in the New York Zoological Park and at Bernardsville, New Jersey. The birds will be confined in large flight cages and liberated in the spring after they have become accustomed to their new surroundings and have shown signs of pairing off. Several Mockingbirds which have been set at liberty in the Zoological Park have made themselves completely at home for several

months, and one individual has lived in the Botanical Garden and the Zoological Park during the past two years, summer and winter,—finding its own food.

The Cardinal is common in Central Park but almost unknown in the surrounding country, and Chapman records the Mockingbird as breeding for several years in succession at Tenafly, New Jersey.

WHOLESALE REARING OF PHEASANTS.

THE rearing of game-birds for the stocking of preserves and for the beauty which their splendid plumage adds to wood and meadow of country estates is an industry which is rapidly growing and, from an economic standpoint, becoming of more and more importance. The Department of Agriculture will soon publish a Bulletin devoted to Pheasant Propagation, and from many states pamphlets and reports are constantly being received, showing how widespread is the interest.

In New York State a farm of two hundred acres near Sherburne has been acquired by the State Game Commission for the purpose of propagating game birds. Mr. H. T. Rogers, a practical game-keeper, is in charge and informs us that five hundred pairs of pheasants have already been purchased, it being the intention of Commissioner Whipple to send out, in the spring of 1910, several thousand young birds and if possible fifteen thousand eggs.* These eggs will be sent to farmers with a printed circular from the Game Commission giving explicit directions as to hatching the eggs under a fowl and caring for the young Pheasants afterwards. In this way it is hoped to introduce the Pheasant broadcast over the state, gaining thereby not only the addition of a beautiful bird to our coverts (now left so vacant by the depletion of Grouse, Bob-white and Woodcock), but also a splendid game-bird, and in addition valuable to the farmer in feeding on injurious insects.

This is the first state work of the kind taken up in New York, but there are scores of private estates where Pheasants are bred and the statement that "tens of thousands of English Pheasants are reared every season on Long Island, in New Jersey and New York" is probably not exaggerated.

Mr. Bayard Thayer writes me from Lancaster, Mass., concerning Pheasants, "I raised this year about twelve hundred and have stocked the

country about here for ten miles from the overflow, as I never shoot my coverts very hard."

The most successful introduction of Pheasants in the United States has been in the northwest, where in Washington and Oregon there are great numbers of Ring-necked, Golden and Silver. The abundance of these birds may be gauged from the fact that on the first open day of hunting in one of those states, more than fifty thousand Pheasants were bagged.

To those of us who are interested in Pheasants from an aesthetic rather than a gastronomic standpoint, there remain the most wonderfully colored of all—the Impeyans, Tragopans and many others which are not prolific breeders, and whose beauty will not therefore become blood-spattered bunches of feathers in the bag of every man who can own a gun.

It is a great pity that our native game-birds are so difficult to hatch and rear in captivity that they will probably never be able to compete with their more prolific and adaptable Asiatic cousins.

MY AVIARY AND ITS INMATES.

By WILLIAM H. BROWNING.

Member of the New York Zoological Society and of the Avicultural Society of England.

IN England the keeping of foreign birds in aviaries has long been practiced, as one can judge from the membership of the Avicultural Societies of that country.

In America the private aviary is rapidly becoming popular, and with reason, for it is a hobby out of which those who are naturally fond of birds can get a lot of genuine pleasure.

Most people are fond of the singing of birds, and a well-selected aviary is a musical song box. Some admire birds for their plumage, while others make the experiment from a scientific interest in the breeding and rearing of rare foreign species. In a well-constructed aviary, the birds are perfectly happy.

My aviary, on my estate at Rye, New York, close to the waters of the Sound, is about fifty feet long by twelve in width. It is built of wood somewhat in old Dutch style. It faces south and the north side is placed as close as we could get it to some large elm trees which overshadow the roof, so that when the sun is high in summer, it is not too hot inside. The south side is glass for about seven feet from the ground, so that a sun parlor is available in winter.

Inside the house is a passageway about four feet wide which runs straight through from end to end. From this the flights—and there are ten of them—are divided off by ordinary $\frac{3}{8}$ wire.

*A record was kept several years ago by Mr. Rogers of one hundred pheasant hens. During three months, April, May and June, they showed a yield of 4637 eggs, of which 80 to 90 per cent. hatched.

The flights resemble stalls, each being 5 ft. x 8 ft. x 12 ft. high. They are divided with wood up to a height of about seven feet, and from there to the roof the $\frac{3}{8}$ wire is used. The wood is set in a slot like the door of a coal bin, so that two flights can be easily made into one if it should be found desirable.

I used $\frac{3}{8}$ wire as mice cannot get through it and they can get through $\frac{1}{8}$ -inch wire. In each flight there is a door. It is purposely made low—about $4\frac{1}{2}$ ft. in height—and at the side of the door is a box jutting out about eight inches into the passageway. It is 2' 6" high by 4' 6" long, divided by a board in the middle, so that the same box runs from one flight to the one adjoining. The cover is hinged and divided in two, and by raising these covers the food can be placed in the flights without opening the doors.

I have found this arrangement very satisfactory. If I had it to do over, the only improvement I could suggest would be to make a metal tray, like the tray of a bird cage, at the bottom of each box.

There is a one-inch water-pipe running lengthwise through the middle of the flights, and in the centre of each flight is a tee from which a one-half-inch pipe comes up through the floor to a height of about four inches. The top of this short half-inch connection is threaded, and after it had been slit with a hack saw, I screwed on each one an ordinary half-inch cap. I found that I could adjust the flow of water by the distance I screwed the cap down, and that the spray was forced directly downward.

Another hole was made through the floor, close to the inlet, and a one-inch coupling set flush with the bottom of the basin. In this a short piece of pipe about two and a half inches long is screwed loosely. If it is removed, all the water washes away and if left in, it will not rise above its level.

My basins are made of concrete. I had a plumber make two galvanized iron hoops for a mould—the larger about 1' 8" in diameter by 5 inches high, and the smaller 1' 6" in diameter by 4 inches wide. By setting the smaller inside the larger, and raising the inside one, one inch from the floor, it is easy to see how each basin was made.

The cost of the twenty basins—for there are ten in the outside flights besides the ten inside—was about twenty dollars.

On the outside I used brass pipe and a brass cap for the short connection, and there is no waste, the water overflowing on the sand.

One 10 x 10 pane in the lower sash, which raises outward and hooks back, is used as a door.

This gives access to the outdoor flights which are in dimensions 5 x 8 ft. by the height of the roof, which is hipped with about 2 ft. overhang, giving a little shelter up close to the house. The rest outside is a wooden frame covered with the $\frac{3}{8}$ wire. The house is ceiled inside and painted white with cold water paint. The basins are enameled white. The outside wire is painted black and the frame black. The roof is shingled and stained black. From the eaves downward white boards are placed upright with round moulding over the seams for a distance of about 5 ft. from the ground, where a white round moulding runs around three sides of the house, and below this are old-fashioned long split shingles.

The house is heated by four 3-inch water pipes running low against the north wall and so arranged that they can be used in pairs or not, as necessary.

I planned the interior and let the Architect, Mr. Oscar Blumner, frame around it as artistically as he could. The cost of the house was about nine hundred dollars. If I had it to rebuild, the only improvements I would make would be to ceil it inside with hardwood and use wire glass and metal sash on the windows, as the destructive bills of some of the cockatoos keep me busy patching it up.

I do not like a concrete house for birds. It might do in some places but it is too damp with us close to the water. It would be all right in the winter, when the heat is on, but in the spring and fall the birds would suffer. We keep the place comparatively cool. In the winter the temperature ranges from 50 to 60, and even if it gets below that it never seems to inconvenience the birds.

In winter I could not take a newly purchased bird which had probably been kept in a much warmer temperature, and turn him out suddenly in so cool a place, but birds that have been acclimated are all the better for the low temperature.

The most essential thing for the birds is fresh air, and I allow them the outdoor flights from about the 10th of May to the last of October.

I feed the seed-eating birds on canary seed, hemp and sunflower and more or less dried wheaten bread, which I purchase by the quantity for chickens at \$1.75 per 100 lbs. They also have green food from the garden. The insect eaters are fed on ordinary mockingbird food, Abraham's preserved yolk of egg which I am obliged to import, and minced raw meat. I presume the total feed bill would average close to \$10 per month.



FRONT VIEW OF AVIARY.

My gardener looks after the aviary and I have no regular keeper. My principal losses have been due to placing the wrong kinds of birds together, resulting in their killing each other, particularly at breeding time; and to over-eating and consequent fatty degeneration; while a few are occasionally lost from injuries caused by striking their heads when frightened, particularly at night. On the whole, however, the losses are no greater than with chickens or any other domestic fowls.

Now, as regards the inmates, in the first flight there are, at present, three Cockateels (these nest readily in confinement), a pair of Crimson-winged and a female Red-rump Parrakeet, besides three Green Love-birds. In the second: Dominican Cardinals, Java Sparrows and a few Canaries. In the third: a pair of Leadbeater Cockatoos. In the fourth: Zebra Finches, Manikins, Weaver birds and a lot of other small Finches. The Zebra Finches have bred so abundantly that they outnumber the others three to one.

In the fifth: Budgerigers, or Australian Grass Parakeets, of which I have bred a large number. For breeding places, I first used coconut husks, imported from E. W. Harper, Wolverhampton, England, and latterly have been using the No. B logs made by Mr. Herman Scheid, Buren i. Westfalen, Germany, which can be imported for about 50c. apiece.

In the sixth flight there are a pair of Blue Mountain

Lories, two Green Cardinals, an Indian Shama, and a lot of other small birds. The Blue Mountain Lories are spiteful with other parrots but they do not seem to pay much attention to the smaller birds.

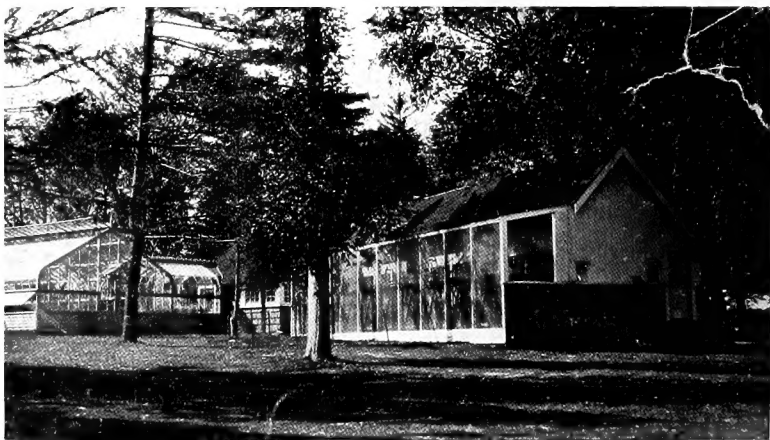
In the seventh: A pair of Rosellas and a male Ring-neck Parrakeet. I had two pairs of Rosellas, but this spring one of the cocks killed the other pair, and although the surviving hen laid eggs she did not hatch them.

In the eighth is a pair of Minors, a Malabar Minor, a Green Barbet, a pair of Starlings, a Rose-Colored Paster, another Shama, a Mexican Solitaire (a very fine singer by the way) and an Indian Drongo. This last is supposed to be a very delicate bird, but he has now been in good health for over a year.

In the ninth: A Red-vented Parrot and a male New Guinea Green Electus. The New Guinea Electus is a stupid bird, but I purchased him with the intention of procuring a mate which up to the present I have been unable to do.

In the tenth: A pair of Pennants and a female Slaty-headed Parrakeet. I lost the male through what was apparently sun-stroke.

In conclusion let me say again that any one who is fond of birds will find the keeping of a private aviary such as I have described, a fascinating and inexpensive hobby, and that I shall be pleased to give any further advice I can on this subject to any one desiring it.



SIDE VIEW OF AVIARY.

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